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THE IMPACT OF VOLUNTARY PRE-KINDERGARTEN ON THE ACADEMIC
ACHIEVEMENT AND KINDERGARTEN READINESS OF STUDENTS IN A LARGE
SUBURBAN SCHOOL DISTRICT

by

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A dissertation submitted in partial fulfillment of the requirements
for the degree of Doctor of Education
in the School of Teaching, Learning, and Leadership
in the College of Education
at the University of Central Florida
Orlando, Florida

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2013

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ABSTRACT

Throughout the United States, state governments are allocating millions of dollars to support Voluntary Pre-Kindergarten (VPK) programs. Recent research has indicated that students that participate in VPK demonstrate higher academic achievement scores across a number of subject areas. Moreover, VPK participants are more likely to enter primary school on grade level, which in turn leads to a reduction in grade retention. Studies have indicated that although all students that participate in VPK programs benefit from such programs, minority students and students that come from low-socioeconomic backgrounds benefit at an even higher level.

The intent of this study was to determine to what extent, if any, a VPK program within a large, suburban school district impacted the academic achievement and kindergarten preparedness of participants in comparison to students that did not participate in the VPK program offered by the district. To measure the impact, student scores on the 2006-2007 Florida Kindergarten Readiness Screener (FLKRS) were compared through the use of an independent samples *t*-test. The same students had their 3rd grade Florida Comprehensive Assessment Test (FCAT) Reading and Mathematics scored compared as well. Two groups were compared against one another. The control group was a group of students that did not participate in the VPK offered by the school district. The treatment group was the group of students that participated in the district offered VPK.

The results of each of the independent sample *t*-tests conducted determined that there was not a statistically significant difference in either student preparedness or student academic achievement between the VPK participant group and the non-participant group.

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Last and certainly not least, I would like to thank those that are closest to me, my dear friends and family. Without their support and patience, this process would have been exceptionally more challenging. To my friends, thank you for not giving me too hard of a time for the fun times I had to miss out on due to various papers and projects I was working on. Also, to my friends, thank you for teaching me humility as each of you has consistently reminded me that you will never call me doctor.

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LIST OF ACRONYMS AND ABBREVIATIONS

ARRA	American Recovery and Investment Act of 2009
CBK	Core Body of Knowledge
CCDF	Child Care Development Fund
CDA	Child Development Associate
DCF	Department of Children and Families
DIBELS	Dynamic Indicators of Basic Early Literacy Skills
ECE	Early Childhood Education
ECHOS	Early Childhood Observation System
ECLS-K	Early Childhood Longitudinal Study Kindergarten
ELL	English Language Learner
ESE	Exceptional Student Education
ESOL	English for Speakers of Other Languages
FACES	Family and Child Experiences Survey
FAIR	Florida Assessments for Instruction in Reading
FCAT	Florida Comprehensive Assessment Test
FLDOE	Florida Department of Education
FLKRS	Florida Kindergarten Readiness Screener
FRL	Free and Reduced Lunch
GED	General Education Diploma
GDP	Gross Domestic Product
IRB	Internal Review Board
MSRP	Michigan School Readiness Program

NCEE	National Center on Education and the Economy
NCES	National Center for Education Statistics
NIEER	National Institute for Early Education Research
OECD	Organisation for Economic Co-operation and Development
OPRE	Office of Planning, Research, and Evaluation
R & R	Recognition and Response
SAVS	Self-Assessment Validation System
TANF	Temporary Assistance for Needy Families
TN-VPK	Tennessee Voluntary Pre-Kindergarten
UNICEF	United Nations Children's Fund
UPK	Universal Pre-Kindergarten
VPK	Voluntary Pre-Kindergarten

CHAPTER ONE: PROBLEM STATEMENT AND DESIGN COMPONENTS

Introduction

As many states throughout the nation face budget shortfalls, a number of programs that receive state funding are being scrutinized in order to assess the cost effectiveness of said programs. Legislators responsible for allocating funding to these various programs are eager to ensure they are getting a worthwhile return on investment. Of the programs being evaluated, one that directly impacts families, student academic achievement, and eventually the national economy is that of Voluntary Pre-Kindergarten (VPK). Over the past decade, states have committed billions of dollars to VPK funding.

A multitude of studies have been conducted throughout the United States over the past decade in order to determine if students who participate in VPK outperform students who did not attend pre-kindergarten. Overwhelmingly, the results of these studies indicate that there is a statistically significant difference in academic achievement and preparedness for kindergarten between the two groups.

To measure student readiness upon entering primary school, the Florida Department of Education (FLDOE) mandates that each public school has to administer the Florida Kindergarten Readiness Screener (FLKRS) to all kindergarten students in the school district within the first 30 school days of the school year. Moreover, each child enrolled in the VPK education program in the previous school year must take the FLKRS, regardless of whether the child is admitted to kindergarten in a public or non-public school. In addition to student outcomes on various assessments such as the FLKRS, recent research has reported on the findings of kindergarten

teacher surveys which indicate that educators clearly identify a discernible difference in student preparedness for kindergarten between VPK participants and non-participants.

For the purposes of this writing, the following terms will be defined as follows:

Definition of Terms

The following definitions were used to explain the vocabulary in this study. The terms are defined in accordance with their significance and context within the study.

- **Confounding Variable:** A variable outside the control of a researcher that may impact the outcome of the study.
- **Dynamic Indicators of Basic Early Literacy Skills (DIBELS):** Standardized, individually administered measures of early literacy development. The assessment is designed to be a concise (one minute) fluency measurement used to continually monitor the development of pre-reading and early reading skills.
- **Early Childhood Observation System (ECHOS):** An observational assessment which measures students against seven distinct benchmarks. The benchmarks include: language and literacy, mathematics, social and personal skills, science, social studies, physical development and fitness, and creative arts.
- **Exceptional Student Education (ESE):** Students who are diagnosed with a learning or behavioral disability as defined by the federal Individuals with Disabilities Education Act (IDEA).
- **Florida Kindergarten Readiness Screener (FLKRS):** A test given to kindergarten students within their first 30 days of kindergarten attendance in order to determine the students level of preparedness upon entering kindergarten.

- **Free and Reduced Lunch Student (FRL):** An economically impoverished student who qualifies for free and reduced lunch due to family income level.
- **Kindergarten Readiness/Preparedness:** The level of preparedness a student exhibits regarding basic mathematical, reading, writing, and text identification skills.
- **Head Start:** A federally funded early education program focused on low income children from birth to five years of age.
- **Print Concepts:** A student's ability to recognize words and associate them with corresponding images.
- **Voluntary Pre-Kindergarten (VPK):** State-funded pre-kindergarten that does not mandate student attendance.
- **Universal Pre-Kindergarten (UPK):** State-funded pre-kindergarten that does not mandate student attendance.

Conceptual Framework

The need for this study was rooted in the work of myriad researchers over the past ten years that have consistently reported the positive correlation between student participation in pre-kindergarten and the student's academic achievement and readiness for kindergarten. The ensuing review of literature will speak to the body of work available that clearly indicates the correlation between VPK participation and increased student achievement and preparedness for entry to kindergarten. Furthermore, the cited studies also indicate which factors VPK participation seemingly did not impact at a statistically significant level.

According to Goldsmith and Meyer (2006), the variables responsible for increased VPK funding are concerns of student readiness as they enter primary school, advances in early brain

development research, the increased rate of working mothers and their need for child care, the impact of pre-kindergarten advocacy groups, and the predicted economic impact postulated by economists.

Further demonstrating the attention being given to pre-kindergarten education throughout the nation, Winsler et al. (2008) identified that as of 2002, 38 states had implemented state-funded pre-kindergarten programs. Moreover, it was reported that 26 state legislatures proposed additional funding for state pre-kindergarten programs in the 2006 fiscal year (Goldsmith & Meyer, p.3, 2006).

Several states and universities throughout the United States have conducted studies over the past few years to ascertain the impact of VPK on student achievement and student readiness as they enter kindergarten. VPK is available throughout the nation to four-year old children at no charge. Moreover, as the name implies, there is no expectation of mandatory attendance. VPK is often funded through state legislatures and the organizations / groups that operate centers providing VPK can be public, private, faith-based, operated from home, or a combination of the previously stated options. The reviewed literature for this writing will focus on primarily on state-funded programs.

It should be noted that a self-reported shortfall consistent across multiple studies reviewed for this writing identified a disparity in certification required for personnel working in the VPK programs across states. Some VPK programs require teachers to hold a bachelor's degree from an accredited institution, while other programs only require minimal certification that can be obtained within just a few years (Peisner-Feinberg & Schaaf, 2007; Bryant, Clifford, Early, & Little, 2005). The difference in teacher quality could reasonably act as a confounding variable when looking at the success of students across various VPK programs. Moreover, some

of the studies reviewed for this writing refer to the impact of Universal Pre-kindergarten (UPK), which is the title of the state funded, non-mandatory program in a number of states. There is no distinction between VPK and UPK, it is simply a difference in title.

A study conducted by Barnett, Lamy, and Jung (2005) out of Rutgers University examined the impact of state-funded VPK programs in multiple states. The states evaluated were: Michigan, New Jersey, Oklahoma, South Carolina, and West Virginia. The performance analysis found a number of positive impacts in student vocabulary, math skills, and understanding of print concepts. Specifically, participants that attended VPK demonstrated “31% more growth over the year and an 8% increase in average children's average vocabulary scores” (p.2). The heightened student performance translated into an additional four months of progress in vocabulary growth due to the preschool program. The study also reported that VPK participants demonstrated 44% more growth over a year, with a 13% increase in the student's average math scores. The most significant findings of the Rutgers study were related to print awareness of the children. Print awareness refers to the familiarity with letters, letter-sound associations, words, and books. The study found an 85% increase in print awareness over a year, which yielded a 39% increase in print aware scores.

A similar study conducted by Lipsey, Hofer, Bilbrey, and Farran (2011) out of Vanderbilt University sought to examine the effectiveness of state funded VPK in Tennessee. The Tennessee VPK program serves over 900 classrooms and more than 18,000 at-risk children. The authors of this study administered a Woodcock Johnson III achievement test of pre-reading, mathematics skills, and language to two groups. One group received VPK, the other group did not. The study found that VPK participant group achieved at a significantly higher level than the students that did not participate in VPK on all administered tests. Furthermore, it was reported that the VPK

participant group also outperformed the non-participant group in the kindergarten teacher rated assessments of kindergarten readiness and work-related skills.

In the studying the impact of pre-kindergarten in the State of Georgia, Raden (1999) cited a longitudinal study conducted by researchers at Georgia State University that reported a majority of surveyed kindergarten teachers stated that VPK participants were better prepared for kindergarten. The teachers specifically cited increased student achievement in pre-reading, pre-math, motor skill development, and adult and child interaction (as cited in Henderson, Basile, & Henry, 1999). What's more, the Georgia State study also reported that surveyed kindergarten instructors rated 64% of students that had participated in VPK as being more well-prepared at the onset of kindergarten. Admittedly, the shortfall of the Georgia State analysis was that the group of students that participated in VPK did not have a group of non-participants in which to compare achievement scores and teacher ratings.

Gormley, Gayer, Phillips, and Dawson (2005) of Georgetown University studied the impact of the Universal Pre-Kindergarten program of Oklahoma on student cognitive development. The researchers in this study also utilized the Woodcock-Johnson Achievement test to measure student achievement. The study not only reported that students participating in the program achieved at a statistically significant level in all areas measured (letter-word recognition, spelling, applied problems), the authors also found that minority groups benefited significantly from the participation in the program. It was reported that although there were significant test score improvements across all ethnic and socioeconomic groups, Hispanic, Black, and Native American groups scored exceptionally well (Gormley et al, 2005, p.20).

In comparing the impact of three different forms of pre-k on kindergarten readiness, academic achievement, and socio-emotional behavior, Winsler et al. (2008) found that students

participating in state-funded pre-kindergarten programs in the Dade County School District made sizable gains comparable to students participating in a subsidized, center-based pre-kindergarten program. The findings stated that students attending public school Title 1 pre-kindergarten programs generally began the school year within the 37th to 50th percentile, which is lower than the national average on the previously indicated measures (readiness, academic achievement, and socio-emotional behavior). The students measured made significant gains in each area, raising their achievement to the 63rd percentile. Regarding behavioral problems as measured by reports from instructors and parents, no change over time was reported.

In comparing the movement towards increased funding of pre-kindergarten programs, is the United States in line with other industrialized nations? In a 2005 report issued by the National Center on Education and the Economy (NCEE), it appears the U.S. is moving in a similar direction as other nations, however, the scale of our implementation is not on par with countries such as Italy, France, Japan, Sweden, and the United Kingdom. In comparing the per pupil allocation of the United States with other nations, per pupil spending is commensurate, however levels of participation are not. The NCEE report showed student participation levels of 4 year-old students at 100% in France and Italy, and 94% in the United Kingdom. Similarly, Sweden showed a participation rate of 64%. In the states analyzed in the U.S., Oklahoma demonstrated a participation level of 64% and Georgia was reported at 56%, while New York was listed at 30% and New Jersey was listed at 25%.

More recent data from the website of the Children's Defense Fund, updated as of January 2012, reported that the overall percentage of children in United States participating in either state pre-k, Head Start, or a special education program is at 40.3%.

The NCEE report also stated that as of 2000, of the American students participating in pre-k programs throughout the nation, students coming from low-income households participate at a rate of 44%, while students coming from homes earning in excess of \$50,000 per year participate at a rate of 65%. Seemingly a contrary finding being that students coming from economically disadvantaged backgrounds typically need additional support.

As previously stated in this writing, one of the limitations of comparing the multiple studies reviewed was the disparity in teacher certification. Some states require more rigorous certification standards than others, which can impact student learning. Jacobsen (2005) cited a Yale study that looked at the expulsion rate of pre-schoolers in comparison to the expulsion rate of students at the K-12 level. The Yale study found that pre-school students enrolled in state funded VPK programs were being expelled from the programs at a rate of 6.67 per 1000 students, whereas students at the K-12 level were being expelled at a rate of 2.09 per 1000 students. Walter S. Gilliam, a psychologist and associate research scientist at the Yale Child Study Center that conducted the study, stated that the lack of training on behalf of the pre-k instructors could reasonably have an impact on their inability to handle difficult students.

In analyzing survey data collected from over 50 state funded pre-kindergarten programs in 40 states, Gilliam (2005) reported that male students were expelled at a rate 4.5 times greater than female students. The comparison of expulsion rates across ethnic groups found that African-American students were expelled twice as much as their Caucasian and Hispanic counterparts, and 5 times more often than Asian students.

Another limitation of generalizing results of collected VPK student data is the impact that variables outside the control of VPK can have on student achievement. Specifically, the impact factors such as the quality of family life, neighborhood quality, access to resources, and parental

education level can have on a student. A 2006 study conducted by researchers collaborating from the University of North Carolina at Chapel Hill, University of Virginia, and the University of California at Los Angeles studied the effect of such factors on the competence of students enrolled in VPK. The study concluded that a socioeconomic resource factor which includes level of parental education, household earnings, and material need, was an accurate predictor in all measured areas of student functioning.” It was reported that pre-kindergarten students that hailed from homes considered high in socioeconomic resources began pre-kindergarten with more extensive language and mathematical skills and fewer behavioral disorders than their peers that came from impoverished homes (Barbarin et al. 2006).

Statement of the Problem

As state legislatures face budget shortfalls, they must look to lessen funding or outright dissolve certain state-funded programs. Do such programs significantly impact the academic achievement of students that participate as compared to students that do not? Does VPK impact underprivileged students in a manner that merits keeping the program? To date there is insufficient information differentiating the impact of VPK offered by a particular school district on the academic achievement and kindergarten readiness of the program's participants as compared to other kindergarteners that did not participate in the VPK offered by the school district.

Purpose of the Study

The purpose of this study was to determine whether there was a statistically significant difference in academic achievement and kindergarten readiness between students who participated in the school district's VPK and those who did not participate in the VPK offered by

the school district. This study aimed to provide state lawmakers and local school leaders with evidence to prove or disprove their thought process when allocating state funds.

Research Questions

- 1) What is the difference, if any, in kindergarten preparedness between district VPK participants and non-participants as measured by the Florida Kindergarten Readiness Screener?
- 2) What is the difference, if any, in student achievement on the 3rd grade Florida Comprehensive Assessment Test (FCAT) Reading between district VPK participants and non-participants?
- 3) What is the difference, if any, in student achievement on the 3rd grade Florida Comprehensive Assessment Test (FCAT) Mathematics between district VPK participants and non-participants?

Hypotheses

- **Null Hypothesis 1.** There is no statistically significant difference in kindergarten readiness on the Florida Kindergarten Readiness Screener between district VPK participants and non-participants.
- **Null Hypothesis 2.** There is no statistically significant difference in achievement on the FCAT Reading between district VPK participants and non-participants.
- **Null Hypothesis 3.** There is no statistically significant difference in achievement on the FCAT Mathematics between district VPK participants and non-participants.

- **Research Hypothesis 1.** There is a statistically significant difference in kindergarten readiness on the Florida Kindergarten Readiness Screener between district VPK participants and non-participants.
- **Research Hypothesis 2.** There is a statistically significant difference in achievement on the FCAT Reading between district VPK participants and non-participants.
- **Research Hypothesis 3.** There is a statistically significant difference in achievement on the FCAT Mathematics between district VPK participants and non-participants.

Variables of Interest

For the purpose of this study, the control group will be the students who did not participate in the district sponsored VPK (independent variable). The treatment group will be the students who participated in the district sponsored VPK (dependent variable).

Table 1. Data Sources to Answer Research Questions

Questions	Data Sources	Dependent/Independent Variables
1	FLKERS results made available by the school district. Identification of VPK participants versus non-participants made available by the school district	Dependent: VPK Participants Independent: Non-Participants
2-3	3 rd Grade FCAT results made available by the school district. Identification of VPK participants versus non-participants made available by the school district.	Dependent: VPK Participants Independent: Non-Participants

Methodology

This quantitative study will utilize archival data maintained by the school district being examined. The required data will be procured from the departments of Assessment and Accountability (FCAT and FLKRS scores), Special Projects (VPK participants), and Information Services. Additional information which assisted the researcher in ascertaining which students participated in the district VPK program and which students did not was procured from the FLDOE. For Research Question 1, a cohort group who attended kindergarten during the 2006-2007 year was selected. From this cohort group, all students that participated in a VPK program had their FLKRS scores entered into a database.

For Research Questions 2 and 3, student achievement scores from the 3rd Grade FCAT Reading and Math were compared between VPK participants and non-participants. The scores were taken from students that were enrolled in 3rd grade during the 2009-2010 school year. An independent samples *t*-test was conducted to determine the extent to which the scores of the groups differed on each assessment. Once the means were compared to see if there was a statistically significant difference, the effect size of the difference was determined as well. Results were reported and shared with the school district providing the data.

Sample

For each research question, a cluster sample, which includes all students who participated in VPK, was selected from a large, suburban school district in Central Florida. The Florida Department of Education was contacted in order to provide information detailing whether or not the students attended VPK provided by the school district or outside of the district (whether public or private, or no pre-kindergarten at all). Due to time constraints, FLDOE was not able to

provide the requested data. As of the 2011 census, the county in which the school district is located is home to over 420,000 residents. The demographic distribution of county is as follows: 81.6% Caucasian, 17.7% Hispanic, 11.7% Black, and 3.9% Asian. 10% of the residents live in poverty.

The 222 participants in the treatment group were selected due to their participation in VPK offered by the school district. A corresponding stratified random sample of 221 non-participating students was randomly selected as well. The sample was not matched to the socioeconomic and demographic breakdown of the treatment group because the demographic characteristics of the students were not provided by the school district.

Instrumentation

The Florida Kindergarten Readiness Screener (FLKRS) was developed by the State of Florida. According to the Florida Department of Education's (FLDOE) website, the FLKRS combines the Early Childhood Observation System (ECHOS) and the first two indicators of the Dynamic Indicators of Basic Early Literacy Skills (DIBELS) for kindergarten (Letter Naming Fluency and Initial Sound Fluency) to ascertain information on the literacy development of Florida's pre-kindergarten participants.

Results from the Florida Comprehensive Assessment Test (FCAT) were analyzed as well. Information located on the FLDOE website stated that the FCAT is an assessment given to students in grades 3-11. The assessment consists of criterion-referenced questions in reading, math, science, and writing.

Procedures

This proposal was submitted to the researcher's dissertation committee. Upon approval and with consent from the Internal Review Board (IRB) and the school district provided the requested data. The school district provided archival data which allowed the researcher to run appropriate statistical analysis to determine whether or not there was a statistically significant difference in student achievement scores and kindergarten preparedness between students who participated in VPK offered by the school district and those who did not participate in the VPK offered by the school district.

Significance of the Study

This study will add to the body of knowledge on the impact of VPK programs on student academic achievement and the impact of VPK on student readiness for primary school. The results of the study will allow school and district leaders to make informed decisions as to whether or not increased financial support of VPK programs is worthwhile.

Analysis

The researcher compared the mean scores of the selected students utilizing an independent samples *t*-test and reported the significance and effect size of the results. The student names on the records analyzed were omitted to ensure confidentiality. Furthermore, the schools in which the students attended was omitted as well. The independent samples *t*-test was conducted with an alpha level of .05, which is commensurate with the confidence level commonly set forth in social science and education research studies. The factors assessed with be the student readiness scores determined by the FLKRS and the academic achievement scores of the participants and non-participants on the 3rd Grade FCAT Reading and Mathematics.

Limitations

- 1) The school district retained the archival data on student achievement on the FLKRS and FCAT scores of students that participated in VPK, however whether a student participated in a private pre-kindergarten was not known.
- 2) It is possible that although students participated in a VPK program in the school district at age four and then went on to participate in kindergarten and third grade within the county, the students could have enrolled elsewhere temporarily and received support that has aided in their academic achievement.
- 3) It is unknown what additional support some VPK participants or non-participants received outside of school. Such support could have acted as a confounding variable and misrepresented the impact or lack thereof of VPK participation.
- 4) The impact of the any VPK program or lack thereof could have been mitigated due to outside socioeconomic and environmental factors that impacted the participants.
- 5) Performance between students from different racial / ethnic groups was not provided due to the fact that the data provided by the school district did not have racial, socioeconomic, or gender differences listed.

Delimitations

The students selected for this study are delimited to the Seminole County School District.

CHAPTER TWO: REVIEW OF THE LITERATURE

Introduction

The intent of this client-based research project is to determine whether or not there is a statistically significant difference in student academic achievement and kindergarten preparedness between students who participated in a state-funded voluntary pre-kindergarten (VPK) program provided by a school district in comparison to students that did not participate in the district offered VPK. The students were measured by their scores on an assessment given to all kindergarten students during their initial nine weeks of the school year (the Florida Kindergarten Readiness Screener). Furthermore, these students had achievement scores from their third grade Florida Comprehensive Assessment Test (FCAT) Reading and Mathematics compared. The county requesting the research project will provide the researcher will archival data which indicates the student achievement scores on both assessments.

This research is relevant to the school district as district leaders look to ensure funds allocated towards VPK programs are resulting in a worthwhile return on investment. As the county in question has experienced budget shortfalls over the past few years, a number of district funded programs are being evaluated so district leaders can make informed decisions as to which programs will remain and which will be cut in order to reduce cost. Depleted budgets are resulting in decreased funding for early education programs throughout the nation.

In a 2011 report from the National Institute for Early Education Research (NIEER) it was stated that per pupil spending on state funded pre-kindergarten programs decreased in 26 of the 39 states that offer such programs. Of the eleven states that increased pre-kindergarten expenditures, the highest increase belonged to Maine, where pre-kindergarten funding received

an additional nine percent over the previous year's funding. The report went on to state that state-funded pre-kindergarten served over 1,300,00 children in 2010-2011. Of the 1.3 million VPK participants, the vast majority of them were three and four year-old children. In terms of actual dollars spent, early education funding decreased by approximately \$60 million dollars in the United States in 2010-2011. That substantial decrease followed a \$30 million dollar decrease in spending in the preceding year (2009-2010). In 2011, states spent an average of \$4151 dollars per VPK participant (Barnett, Carolan, Fitzgerald, & Squires, p.5, 2011).

Advocates throughout the nation champion the need for expanded early education opportunities for all students. A multitude of studies conducted over the past decade have validated the call for additional spending on pre-kindergarten. Program advocates state that pre-kindergarten programs can act as a catalyst in closing the academic achievement gap between social classes and ethnic groups. In a report intended to urge the legislature of the State of Mississippi to get on equal footing with other southern states and implement a state-funded VPK program, Suitts (2010) stated that pre-kindergarten can act as an impetus in setting in motion a long-term learning cycle that will keep students enrolled in school, out of the legal system, and provide them with the foundation necessary to become productive citizens (p.3). Moreover, studies have shown that pre-kindergarten programs can offer economically disadvantaged students access to a resource rich environment, which can positively impact their ability to stay on level with their peers from higher socioeconomic groups (Sylvester & Kragler, p.122, 2011).

Despite the significant number of studies, reports, and journal submissions that support the effectiveness of VPK and advocate the continued funding of such programs, the call for increased allocations to VPK programs is not without detractors. A 2006 brief from the UCLA Center for Mental Health in Schools cited positive findings from VPK research over the past

decade, however the brief also included concerns about VPK effectiveness related to the cost / benefit ratio of such programs, the lack of information on students as they enter adulthood to determine the long term effects of VPK, and the disparity in sample sizes across various studies that have been conducted on VPK (p.8).

Similar to the findings from the ULCA Center for Mental Health in Schools, Kauerz (2006) also emphasized the short-term benefit of pre-kindergarten participation in closing the achievement gap between students of different socioeconomic backgrounds and racial groups. However, the author also stated that the impact of pre-kindergarten programs can fade out shortly thereafter (p.2). Magnuson, Meyers, Ruhm, and Waldfogel (2005) estimated that 60 to 80 percent of cognitive gains in the first year of primary school related to pre-kindergarten participation subsided by the second semester of first grade (as cited in Kauerz, 2006).

Finn (2009) acknowledged the short term positive impact that VPK offers students, especially those from disadvantaged backgrounds, however the author also questioned the long term impact such programs have on students. Finn went on to state that initial gains attributed to participation in VPK are often negligible by the time the students enter third grade (p.15).

The ensuing review of literature will begin with an examination of the background of state funded pre-kindergarten in the United States. Following the historical review, the research will examine the types of pre-kindergarten available throughout the country, as well as the empirically demonstrated benefits / shortcomings of pre-kindergarten as it relates to student academic achievement and student preparedness for kindergarten. The dynamics of pre-kindergarten programs reviewed will include but not be limited to: levels of teacher certification, how pre-kindergarten is implemented globally, the impact of VPK on disadvantaged and English Language Learners (ELL), and traits of effective programs. Attention will also be devoted to the

difference between state funded pre-kindergarten and the federally funded Head Start program. Moreover, recent research will be utilized in determining the effectiveness of pre-kindergarten on the academic achievement of children from differing social classes and racial backgrounds. Being that the intent of this client-based research is for a large district in Central Florida, the review of literature will begin with the state of VPK in Florida.

VPK in the State of Florida

VPK in the State of Florida was enacted through a voter-approved amendment to the state constitution in 2002. The amendment called for VPK for all four-year-old children at no cost (Goldsmith & Meyer, p.12, 2006). Information contained on the Florida Department of Education's (FLDOE) February 2011 VPK Fact sheet states that VPK in the State of Florida is a function of the Department of Education's Office of Early Learning, Florida's Office of Early Learning, and the Department of Children and Families (DCF). The Florida Statutes provide for the funding of pre-kindergarten through §1002.71(3)(a)(b). This statute explicitly states dollar amount the state will provide per student for a given school year.

Additional Florida Statutes mandate specific parameters for which VPK providers in the State of Florida must adhere. Such parameters include, but are not limited to: a) a class size restriction of no more than eighteen students for all pre-kindergarten through grade three classes (§1003.03); b) a requirement of at least 540 hours of instructional time per year (§1002.63); and c) prescribed qualifications for VPK instructor eligibility (§1002.55).

The previously referenced NIEER, compiles data on VPK and produces a yearly report for each state. According to the 2011 report for the State of Florida, in the 2010-2011 school year, Florida provided VPK to 152,356 four-year-old children (164,388 total children). Since the

inception of VPK in the State of Florida, student enrollment in VPK has grown from approximately 100,000 children in 2005 to the current enrollment of over 164,000 in the 2010-2011 school year (Barnett, Carolan, Fitzgerald, & Squires, p.46, 2011). In terms of accessibility for children, the state was the highest rated of all states that offer VPK. Despite the high accessibility ranking, Florida was rated 35th in per pupil spending (\$2422 per pupil). The report also concluded that all 67 counties within the state, offer VPK. Additionally, 76 percent of the eligible four-year-old children in the state participated in VPK.

Despite Florida's high rate of accessibility and growing enrollment, Florida met only three of the 10 benchmarks measured by the 2011 NIEER report. Florida was rated as adequate in having early learning standards, compliance with the state-mandated class size limits, and the establishment of an appropriate site monitoring program for the VPK providers. The seven areas in need of improvement include: required bachelor's degrees for VPK instructors, required specialized training in pre-kindergarten education, increased teaching assistant credentials / certification, 15 hours of in-service training for instructors, teacher / pupil ratios of 1:10 or better, screening / support services, and the providing of one meal per day to all students (Barnett, Carolan, Fitzgerald, & Squires, p.47, 2011).

According to Florida's Office of Early Learning, parents of VPK participants in Florida may elect to send their children to either a public, private, or faith-based VPK provider. Students are given the option to enroll in either the year-long program that consists of 540 instructional hours or the summer program, which consists of 300 instructional hours. Although some states require VPK instructors to hold a bachelor's degree from an accredited institution, Florida requires a minimum of a Child Development Associate (CDA) credential, which is authorized by the National Credentialing Program. In lieu of the CDA, instructors may also obtain an approved

credential from an outside organization, as long as the organization is recognized by the Florida Department of Children and Families (DCF).

According to the FLDOE, VPK providers in the State of Florida are not required to follow a prescribed curriculum. However, in designing their curriculum, each provider is expected to provide students with curriculum that is “developmentally appropriate, designed to prepare a student for early literacy, enhance the age-appropriate progress of students in attaining the state-adopted performance standards, and prepare students to be ready for kindergarten based on the statewide kindergarten screening.” This requirement is pursuant to §1002.67(2)(b) of the Florida Statutes. Although providers are given the flexibility to design their own curriculum, if a provider is placed on probation for failing to maintain adequate kindergarten readiness rates they are required to submit their curricula to the FLDOE for review and approval.

To ensure VPK instructors were provided with timely, accurate, and valid feedback as it pertains to the skill attainment of their students, the FLDOE recently adopted the Florida VPK Assessment. This assessment measures four specific skill sets student need to obtain to ensure kindergarten readiness. The measured skills are as follows: print knowledge, phonological awareness, mathematics, and oral language / vocabulary.

Recent Research on Effectiveness of VPK in Florida

The FLDOE recently released the results of a three-year study in which student readiness for kindergarten was measured between those who completed VPK and those that did not complete VPK. Students that did not participate in VPK at all were also included in the comparison. The study measured student preparedness through the use of the Early Childhood

Observation System (ECHOS) and the Broad Screen / Progress Monitoring portion of the Florida Assessments for Instruction in Reading (FAIR).

According to the 2010 VPK Readiness Fact Sheet made available on the FLDOE website, the ECHOS is a tool that is utilized to measure behaviors, knowledge areas, and skill sets necessary to succeed in primary school. After being observed, students are classified into three ratings categories: a) demonstrating; b) emerging / progressing; and c) not yet demonstrating. The Broad Screen / Progress Monitoring portion of the FAIR test measures a student's ability to name letters. Moreover, the assessment also measures the phonemic awareness of students. Once the results of the Broad Screen are collected, students are assigned a "Probability of Reading Success" score, which is presented on a scale ranging from one to ninety-nine.

The FLDOE findings on the readiness of the three groups of students, as measured by the ECHOS and reported in the 2010 VPK Readiness Fact Sheet, stated that 93 percent of VPK completers (of which there were 103,943), were measured as ready for kindergarten. Of those who participated in the program, but did not successfully complete the program (27,133 students), 87 percent were scored as kindergarten ready, while 83 percent of those who did not participate in VPK (68,213 students) were measured as kindergarten ready.

General VPK Information in the United States

Over the course of the last decade, a substantial amount of research has been conducted on behalf of early childhood education and the benefits that are derived from programs such as VPK and the federally funded Head Start program. Meyer and Goldsmith (2006) attributed the growth of early education programs throughout the United States to five factors. Those factors are: 1) concerns related to student readiness for primary school; 2) advances in early brain

development research; 3) an increase in working mothers and their subsequent need for child care; 4) concerted and well financed efforts by pre-kindergarten advocacy groups; and 5) the promotion of pre-kindergarten as an economic development strategy. (Introduction section, para. 3).

The National Center for Education Statistics (NCES) compiles annual information related to the demographic breakdown of students throughout the nation that participate in early education programs. According to recent data from the 2010 school year, the NCES reported the racial distribution of participants as follows: 71 percent of eligible Asian students participated, which was slightly higher than the 67 percent of Caucasian students that participated. Amongst Hispanic and African American students that participated in early education programs, NCES reported their participation at 65 percent (African American) and 56 percent (Hispanic). In terms of level of parental education, the NCES reported that:

Higher percentages of 3- to 5-year-olds whose parents have either a graduate or professional degree (78 percent) or a bachelor's degree (72 percent) were enrolled in preprimary programs than children of parents with any other level of educational attainment, which ranged from 48 to 62 percent. Children whose parents have less than a high school credential had the lowest percentage of enrollment in preprimary programs (Early Education and Child Care Arrangements, para. 4).

What's more, the NCES report also found that in differentiating the racial breakdown of which groups attended half day or full day programs, African American students comprised the highest percentage of full day participation (52 percent). Comparatively, the 52 percent participation rate of African American students was noticeably higher than that of Hispanics (32 percent), Caucasians (36 percent) and Asians (36 percent). Despite the higher rate of full day participation,

African American students continue to score lower on measures of kindergarten readiness, as well as other measures of academic ability in comparison to students of other racial groups (Early Education and Child Care Arrangements, para. 3).

It should be noted that the data reported by the NCES was inclusive of more than students enrolled in VPK programs, which accounts for the higher percentages of participants by racial group than other organizations reported.

The 2011 NIEER report on the state of pre-kindergarten programs focused on state and federally funded programs. The authors of the report found that 28 percent of eligible four-year-olds and four percent of eligible three-year-old children participated in pre-kindergarten programs. Of the 39 states offering state-funded pre-kindergarten programs, the national averages for specific participation amongst four year-olds were as follows: 28 percent attended VPK, 29 percent private pre-kindergarten, 26 percent did not participate, 11 percent attended Head Start, 3 percent attended a special education program, and 3 percent were reported as other public pre-kindergarten program (p.6).

Total VPK spending nationwide was in excess of \$5.4 billion. Additionally, nearly \$145 million was allocated to Head Start. In terms of per pupil allocations, as previously reported the average VPK student in the United States was allocated \$4,151 by their respective state. When adding in federal, local, and other funds (TANF, ARRA, CCDF), the average per pupil allocation was averaged at \$4,847. Per pupil spending for Head Start participants was reported at \$8,774. Comparatively, the average per pupil allocation for an average K-12 student in the United States was \$12,442 (p.6).

Differentiation between Head Start and VPK in the United States

According to the U.S. Department of Health and Human Services web page, the Head Start program is a function of the Administration for Children and Families, which is overseen by the U.S. Department of Health and Human Services. Although VPK is often targeted at providing an academic foundation to students in need, it is generally made available to any and all students that wish to participate. Head Start differs in that it is targeted toward economically disadvantaged children. The general intent of Head Start is to endow disadvantaged children from birth to five years of age with opportunities to ensure they are prepared for entry into kindergarten. Head Start provides support in the areas of social, cognitive, and emotional development (About Head Start, para. 1).

Another key distinction between the Head Start and VPK are the additional services made available through Head Start. In addition to providing students with comparable academic provisions provided by VPK, Head Start also offers disadvantaged families comprehensive services to program participants and their families. The level of assistance, which can include nutritional, wellness, social or other services, is determined by a needs assessment administered to the family (About Head Start, para. 2). Moreover, the program also aims to cultivate positive relationships between parents and their children, train families to act as advocates and leaders, and connect families to peers other community resources (About Head Start, para. 4).

A similarity between Head Start and VPK is the multitude of implementation methods. Head Start programs can be facilitated in centers, school houses, child care facilities, or individual homes. Additionally, the program can be offered in a full or half-day model (Head Start Services, para 3).

Additional Information Regarding Head Start

A 2011 report released by the Office of Planning, Research, and Evaluation (OPRE) analyzed a number of characteristics pertaining to Head Start. The report included data on student performance and the demographic distribution of participants. Moreover, the report also identified changes that were denoted over the course of previous studies tracking similar variables. To procure the data, information was drawn from the Family and Child Experiences Survey (FACES), which is given yearly to Head Start participants by the Administration for Children and Families (p.1).

In analyzing the demographic break down of Head Start participants in comparison to VPK participants, the report found that 61 percent of first-time Head Start participants were three years of age. This is a significant difference as the overwhelming majority of VPK participants nationwide are 4 years of age. Of children participating in Head Start 36 percent are Hispanic and 33 percent are African-American. The distribution of male and female students is almost even (p.5).

In analyzing additional traits of Head Start participants, the report also stated that as of 2009 the overwhelming majority of Head Start entrants (95 percent) lived with at least one biological parent. Moreover, only 27 percent of Head Start participants live in a household in which the parents are married (p.6). Regarding the level of parental education, 64 percent of mothers of Head Start students had obtained a high school diploma or GED, while 54 percent of the fathers had completed high school or a GED (p.7).

Looking at the academic achievement of children as they enter Head Start in comparison to other student scores on nationally normed tests, the report found significant differences in test scores on that measured mathematical skills, language, and literacy. Head Start entrants scored

nearly one standard deviation below the national norm on an English receptive vocabulary test (87.2), two-thirds of a standard deviation below the national norm assessing applied problems (89.5), and one-third of a standard deviation below national norms on letter-word identification (95.9) and early writing (94.5) (p. 14).

Presenting at the SREE Spring Conference, Hyman (2011) examined the long term impact of Head Start on participants as they entered adolescence. It was reported that participation in Head Start did demonstrate an improvement in academic achievement during early childhood, however the gains were non-existent as the child entered early adolescence. Hyman went on to report that there was a relationship between Head Start participation and an improvement in long-term outcomes in career earnings, decreases in obesity, crime, and smoking.

A 2010 impact study commissioned by the U.S. Department of Health and Human Services sought to ascertain the effect Head Start has on program participants. The study examined the effect of Head Start on low-income student academic outcomes and overall kindergarten readiness. Additionally, the study aimed to identify the specific circumstances in which Head Start generated the greatest impact on participants (p. i).

The report found that three-year-old and four-year-old participants benefited from Head Start participation at a statistically significant level in the areas of language and literacy, specifically related to vocabulary, spelling, letter-word identification, pre-academic skills, and color identification. Moreover, the three-year-old students also benefited in the areas of applied mathematics problems, hyperactive behavior, and perceptual motor skills and pre-writing. However, in examining the long term outcomes of the students in the study, it was found that only a few of the identified positive outcomes were prevalent as the children entered first grade.

The outcomes that demonstrated a lasting impact where those of vocabulary and improved behavior (p. iv).

In analyzing the impact felt by sub groups within Head Start, the authors found that students that were identified as dual language learners, students with special needs, and students with lower cognitive abilities upon entering Head Start all experienced positive impacts due to their involvement with the program (p.v).

VPK Effectiveness in the United States

A number of studies over the past decade have focused on the effectiveness of VPK programs on student readiness / preparedness for primary school. The studies have ranged from examining longitudinal data to observe the long term impact of VPK participants on students as they enter middle school (Marcon, 1995), the impact of VPK on student academic achievement in mathematics (Perry, 1999), the impact of VPK on literacy development (Sylvester & Kragler, 2012), and how VPK effects the achievement of the economically disadvantaged (Lipse, Hofer, Bilbrey, & Farran 2012).

Perry (1999), studied the impact of pre-kindergarten on student readiness and academic achievement in mathematics. Two groups of students were compared: students that were currently enrolled in pre-kindergarten at the time of the study and students that were enrolled in kindergarten at the time of the study that had previously participated in pre-kindergarten. Both groups of students were measured against a sample of students that had not attended pre-kindergarten. Although the study did not specifically state that the 80 participants selected were in a VPK classroom, the author stated that the students were attending a pre-kindergarten

program at a Title I, public elementary school. Moreover, of the study participants, 85 percent were on FRL.

Utilizing a Kindergarten Readiness Test and an Early Childhood assessment, the findings of the study concluded that the pre-kindergarten participants outscored a group of non-participants by a statistically significant margin. The average mean score of the participant group was 11, while the students not enrolled in pre-kindergarten demonstrated an average mean score of 5.05. The kindergarten students who had previously participated in pre-kindergarten also outscored the non-participant group, however the margin of difference between their mean scores was not as sizable (24.5 to 20.4).

Lamy, Barnett, and Jung (2005) examined the effect the Michigan School Readiness Program (MSRP) had on the abilities of students as they entered kindergarten. The MSRP is a state-funded pre-kindergarten initiative that is focused on providing at-risk pre-kindergarten students with the resources and experiences that peers from other socioeconomic groups often encounter prior to entering kindergarten. The MSRP is not exclusively for the economically disadvantaged as students may attend if they exhibit at least two of 25 risk factors (p.4). Not all risk factors are related to socioeconomic status.

The program assessment included language, early math, and early literacy skills. The researchers utilized data from a sample of 865 students from Michigan. The study concluded that MSRP participants demonstrated 24 percent more growth in vocabulary scores, which represents two months of additional progress over the non-participant group. Furthermore, MSRP participants demonstrated 64 percent more growth in mathematics over the course of the school year in comparison to the non-participants. Additional growth that was significant in comparison to the non-participant group was in comprehension of print concepts. MSRP participants

demonstrated an increased understanding of letter-sound associations, letter identification, and heightened familiarity with word and book concepts. The additional growth over the year in print concepts was recorded at 64 percent. Of the variables measured in the study, no significant difference in phonological awareness was found (p.3).

In evaluating the effectiveness of state-funded pre-kindergarten across five states, Wong, Cook, Barnett, and Jung (2008) reported positive findings regarding student academic achievement in mathematics, receptive vocabulary, and print awareness. The study analyzed data from Michigan, Oklahoma, South Carolina, New Jersey, and West Virginia. The researchers utilized a regression-discontinuity model to attempt to determine the effect of the VPK program in each respective state. The authors of the study focused on a large scale analysis across multiple states due to what they considered to be the limited number of such studies available for review. It was stated that “evaluations of state pre-K programs are rare and limited in scope, restricted to one city, Tulsa, and to one state, Georgia,” (p.123). Since the publication of the study, other large scale evaluations of state-funded VPK programs have been undertaken.

The results of the study concluded that 13 of the 14 measured coefficients demonstrated that the VPK programs had a positive impact on the students. Of the thirteen positive outcomes, 8 were statistically significant (p.147). The authors went on to state that based on their research, state pre-kindergarten programs do have positive effects on the cognitive ability of students, however the size of the effect varies on a state by state basis due to the different manners in which programs are implemented by each state (level of required teacher certification, length of program, whether the program is offered to all students or solely the economically disadvantaged, etc.) (p.122).

Ruhm, Magnuson, and Waldfogel (2007) examined the effect of pre-kindergarten on student academic achievement in math and reading, as well as the impact on student behavior. The researchers utilized data made available from the Early Childhood Longitudinal Study Kindergarten Class of 1998-1999 (ECLS-K). The report concluded that participation in pre-kindergarten raised student reading and math scores at a significant level prior to student entry to kindergarten. The effect sizes of the reading and math scores ranged from .10 to .12. Although the academic indicators of the study yielded positive findings, the authors reported that student behavioral indicators were of concern. It was reported that students that participated in pre-kindergarten demonstrated increased aggression and decreased self-control as they entered kindergarten (p.34).

Howes et al. (2008) studied the impact of state-funded VPK programs on school related learning and social behaviors. The study included 3,000 randomly selected VPK participants across eleven states. The findings of the study demonstrated that VPK participants did benefit academically from the program, although the effect sizes of the gains were not as significant as the findings of other studies. It was reported that students from a multitude of familial structures demonstrated gains from VPK. The gains were consistent across the board for students from different socioeconomic groups and various racial / ethnic groups. Contrary to the findings of other studies, students from low socioeconomic groups did not demonstrated greater gains than other VPK participants (Gains section, para. 1). The researchers suggested that this contrary finding could be due to the sample size and variety of states utilized for the study (Gains section, para. 2).

In analyzing the effectiveness of student participation in pre-kindergarten on student readiness in reading, Chapman (2010) measured student performance in reading by utilizing the

Dynamic Indicators of Basic Early Literacy Skills (DIBELS) scores of the participants during their first year of primary school. The researcher analyzed data from assessments taken at the beginning, middle, and end of the school year. The results of the assessments were then compared between VPK participants and non-participants, ethnicity, and socioeconomic status. The author found that there was a statistically significant difference in reading readiness across the VPK participant groups of all groups examined during each assessment period (p. vii).

Impact of VPK on the Economically Disadvantaged

Determining the impact of VPK on student's that come from impoverished backgrounds has been the focus of a number of studies over recent years. Children raised in socioeconomically disadvantaged areas are often disproportionately diagnosed with learning disabilities, have higher frequencies of grade retention, and are more likely to drop out of school (Burger, 2010, "Effects of socio-economic status on development of the children," para. 2). Attempting to keep students from disadvantaged environments on grade level with their peers from other socioeconomic classes has become a focal point of states throughout the United States.

Lipsey, Hofer, Bilbrey, and Farran (2012) of Vanderbilt University sought to measure the impact the Tennessee Voluntary Pre-Kindergarten (TN-VPK) program had on the readiness of economically disadvantaged students as they entered kindergarten. Utilizing the Woodcock Johnson III achievement test, which measures pre-reading, language, and mathematical skills, the researchers also aimed to ascertain whether there was a statistically significant difference in achievement between TN-VPK participants and non-participants. The study's initial analysis

concluded that TN-VPK participants achieved at a significantly higher level than non-participants on all “direct assessment scales examined, with effect sizes ranging from .08 to .42” (p.4).

A 2005 report from the FPG Child Development Institute at the University of North Carolina (UNC) at Chapel Hill also noted the wide range in which VPK programs are implemented across the nation. The authors of the report stated that there was a “remarkable variability across states in the way in which pre-K programs are being implemented,” (p.6). The researchers noted that most states with VPK programs available are offered to four-year-old children, however many states offer VPK opportunities to children that are three or younger. Furthermore, the report noted that some of the nation's VPK programs focus on at-risk populations, although the definition of at-risk varies across programs. For example, some students are deemed at-risk if they are from an impoverished family, whereas others receive at-risk status if their parents are unemployed, if the parents are suspected of child abuse / neglect, or if the child was born with a low birth weight (Bryant, Clifford, Early, & Little, p.6, 2005).

A separate report released by Peisner-Feinberg and Schaaf (2007) of the FPG Child Development Institute at UNC provided data on student outcomes in the More at Four pre-kindergarten program that serves children across North Carolina. During the 2005-2006 school year, the More at Four program served 17,251 students, 73.6 percent of which were eligible for free lunch. An additional 16.4 percent of the participating students in 2005-2006 were eligible for reduced lunch (p.20). The focus of the More at Four initiative is to provide access to educational services to children that were previously unserved. In the program's third year of implementation (2003-2004), 6,788 previously unserved students attended VPK. In the program's fifth year of implementation (2005-2006), 10,325 previously unserved students attended a VPK program (p.21).

The More at Four program maintains a high level of instructor education. As of 2005-2006, 84.6 percent of instructors in the program held a bachelor's degree or higher, with an additional 13.8 percent holding a master's degree (p.17). In studying the achievement level of the students, the researchers analyzed student outcomes in literacy and language skills, math skills, general knowledge, and behavioral skills. The single cohort analysis concluded that students demonstrated scores statistically significant from zero in all measured areas, with the exception of problematic behaviors (pp. 35-36.) The students measured were each given an assessment in the fall of the program and were then assessed again in the spring.

Peisner-Feinberg (2011) conducted an additional review of the More at Four program to assess the longitudinal impact of the program. In the researcher's most recent program analysis, it was concluded that students participating in the program continue to make significant gains in multiple learning domains, specifically in receptive vocabulary, phonological awareness, print knowledge, letter/word recognition, applied mathematics, counting, social awareness, and social skills. Moreover, although participation in More at Four was positive for all students, it was especially beneficial for students with low English proficiency (p.2).

Continuing to focus on how to increase the preparedness of pre-kindergarten students deemed at-risk, the FPG Child Development Institute at UNC Chapel Hill implemented a recognition and response (R&R) model as a means of early intervention. Buysse, Peisner-Feinberg, and Burchinal (2012) analyzed the effectiveness of the model by comparing the achievement of a group of students in the More at Four program that received the R&R versus a group of students that were not provided R&R. The recognition and response intervention model is predicated on early recognition of students in need of targeted intervention, the use of an

effective core curriculum, progress monitoring, intentional instruction, and the use of formative assessments (p.3).

The researchers reported that although the students receiving the intervention did not demonstrate higher achievement scores in the measured areas than the students they were compared against, the targeted students did demonstrate greater gains from where they started (p.5). Furthermore, the report concluded that the success of the R&R implementation, which allows teachers to more effectively identify students in need of intervention and other support services, will benefit disadvantaged students in positively changing their developmental trajectory and keeping students on grade level. A self-reported shortcoming of the study was the short span of time the R&R program has been analyzed. Additional studies of the R&R program are forthcoming (p.5).

Predating the Buysse, Peisner-Feinberg, and Burchinal (2012) study, Lazarus and Ortega (2007) also emphasized the importance of VPK serving as a conduit for early intervention. Specifically, the 2007 report focused on VPK as a means of preventing students from being retained. The authors of the report stated that the most effective manner in which to raise academic outcomes was to emphasize prevention through high-quality VPK that focused on reading, writing, and basic mathematical skills (p.70). Moreover, the authors also stated that VPK serves as an effective time in which to identify student deficiencies and then provide appropriate interventions. The report concluded by recognizing that students between the ages of zero and five are cognitively ripe and not all students can be expected to perform at a high academic level when they are not afforded equal footing to begin with early in their academic careers (p.70).

The Pennsylvania Department of Education released a 2010 report on the effectiveness of the state-funded Pre-K Counts program. The program was developed to provide at-risk students with access to high quality, research-based opportunities prior to entering primary school (p.3). The findings of the report concluded that almost every participant (over 98 percent) in the 2009-2010 school year demonstrated proficiency that was commensurate with their grade level or emerging proficiency with their grade level. The students were measured in numeracy, literacy, and social skills. Students were measured at the onset of the school year and towards the end of the school year. Over the course of the year, students exhibited significant gains in scientific thinking (increasing proficiency from 17 percent to 68 percent), mathematical thinking (15 percent to 70 percent), language and literacy (19 percent to 71 percent), and personal and social development (26 percent to 77 percent) (p.4).

Further demonstrating the impact of VPK on students that come from disadvantaged backgrounds, McCartney, Burchinal, and Grindal (2011) cited the findings of Mashburn et al. (2008) when it was reported that an 11 state study of large, mature VPK programs demonstrated that VPK participants showed significant positive gains on tests of math, reading, social skills, and language. Even larger positive effects were identified in students with less educated mothers, particularly in receptive language and behavior (p.119).

Impact of VPK on Special Needs Students

The majority of studies reviewed for this writing highlighted the positive impact VPK programs can have on impoverished students, however very few studies specifically noted the impact such programs have on students with special needs, outside the fact that highly trained

educators can identify students with disabilities at an earlier age and then provide or recommend appropriate interventions or services.

In the 2011 NIEER report on the state of pre-school, Barnett, Carolan, Fitzgerald, and Squires (2011) reported that over 432,000 special needs students between the ages of three and four were enrolled in pre-kindergarten programs throughout the United States (p.6). In the State of Florida alone, over 20,000 special needs students were enrolled in VPK at the time of the report (p.47).

Gunter, Caldarella, Korth, and Young (2012) studied the impact of social and emotional learning incorporated in pre-kindergarten. The authors found improvement in student behavior, improved relationships with the instructors, and a decrease in internalizing behaviors (anxiety, depression, withdrawal). The authors implemented a curriculum entitled Strong Start Pre-K, which provides instructors with lessons that are strategically designed to focus on social-emotional learning. Moreover, in addition to providing instructors with a specialized curriculum, the parents of the students are also provided with materials to assist in reinforcing the concepts at home (p.154).

Phillips and Meloy (2012) examined the impact of a school-based pre-kindergarten program in Tulsa, Oklahoma on the kindergarten readiness of program participants classified as special needs. The study concluded that special needs students demonstrated significant gains in literacy, however, the gains were not significantly different from their peers that were not classified as special needs. Regarding mathematics, special needs students did not demonstrate significant gains (p.471).

Impact of VPK on English Language Learners

Of the numerous benefits associated with student participation in VPK, an often cited benefit is the impact of VPK on the academic achievement of students classified as English Language Learners (ELL). A recent study conducted by Bilbrey and Hofer (2012) examined the continuing impact of the VPK program in Tennessee. One of the research questions studied by the authors was the effect of the program on students identified as ELL. The study concluded that ELL children in the program demonstrated significantly higher gains as compared to a group of ELL students that did not participate in the VPK program. The students scored higher on multiple measures of academic proficiency as measured by the Woodcock-Johnson achievement test. Specifically, ELL students participating in VPK scored significantly higher in word identification, spelling, picture vocabulary, and oral comprehension. The only measure that the ELL VPK participants did not score significantly higher on was the applied problems measure of the mathematics assessment (p.44).

Burchinal, Field, Lopez, Howes, and Pianta (2012) sought to analyze the impact of instruction conducted in Spanish and classroom quality on the academic achievement of Spanish speaking students. The researchers reported that there was evidence of improvements in math and reading for Spanish speaking students, however the gains became significant when instruction in Spanish was coupled with increased levels of emotional support from the instructors (Inferential analyses section, para. 7).

Cannon, Jackowitz, and Karoly (2012) examined the school readiness of ELL students enrolled in pre-kindergarten programs throughout California. The intent of the research was to provide policymakers in California with a thorough understanding of variables effecting the experiences of pre-kindergarten participants that have limited English proficiency. With the

information provided in the report, the authors hoped to improve the plight of these students in an effort to close the achievement gap between races (p.7). The report concluded that non-English proficient students that participated in early education programs outside of the home demonstrated achievement scores in reading that were significantly higher than non-English proficient students that did not participate in similar programs. Although reading scores were elevated, the same positive correlation was not evident in regards to mathematics scores (p.23).

Attributes of Effective VPK Programs

Throughout the literature review on the effectiveness of VPK, a number of studies named specific conditions found in various VPK programs that were more indicative of student success than other conditions. The ensuing section will focus on which variables were found to have a correlation to increased student academic achievement and kindergarten preparedness.

In addition to the analysis of student achievement, a unique dynamic to the Howes et al. (2008) study, was the identification of VPK classroom conditions that were determined to have a significant impact on student achievement in comparison to other classroom factors. The authors conducted a hierarchical linear model (HLM) analysis to determine the significance of the relationships of individual classroom variables to student achievement (Data analysis section, para. 1). Specifically, the factors found to impact student achievement were the instructional climate of the classroom, the relationships between the instructors and the VPK students, and the amount of time students were exposed to certain areas of instruction (Dimensions of programs associated with gains: structural and process quality, para. 1).

Similar to findings of Howes et al. (2008), Thomas and Lord (2007) also reported that the interactions and relationships between VPK participants and the instructors were a strong

measure of VPK quality. The study went on to state that instructors that held bachelor's degrees and specialized training have been shown to be beneficial to the social development of students (p. 11). Moreover, VPK instructors with training in special education are important in the early identification of students in need of services / interventions that could prevent them from falling behind their peer group (p.12).

Zaslow (2011) also referenced the importance of pre-kindergarten instructors holding bachelor's degrees, however the reasoning behind the thought process was that in order attract and keep effective pre-kindergarten instructors, they should maintain commensurate certification as traditional K-12 classroom teachers and earn comparable wages. It was stated that by holding pre-kindergarten teachers in the same esteem as traditional instructors, pre-kindergarten students and parents would benefit by decreased teacher turnover and increased staff continuity (p.210).

Barnett, Carolan, Fitzgerald, and Squires (2011), writing on behalf of NIEER emphasized the importance of teacher credentialing, teacher / student ratios, and interactions between instructors and students as characteristics of an effective, high quality VPK program. Decreased student to teacher ratios result in increased interactions between students and teachers, which has been found to increase student achievement (p.24).

Additional best practices for the development of high quality VPK programs include community outreach, the inclusion of special education students into regular education VPK classrooms, ensuring highly qualified and trained personnel, assurance of highly diversified classrooms (bringing together students from different racial and socioeconomic backgrounds can provide students with unique insight not previously afforded to them), providing dual language classrooms to benefit both ESOL students while concurrently giving single language speakers an

opportunity to become bilingual, and providing age appropriate practices school wide to meet the needs of young children (Frede & Barnett, pp. 10-11, 2011).

The 2009-2010 end of year report issued by the Pennsylvania Department of Education, which reported significant gains in all academic areas measured, listed a number of factors that the authors attributed to the student's success and the high quality of the program. Regarding teacher credentialing and certification, 84 percent of the instructors in Pennsylvania VPK programs hold a bachelor's degree, with 66 percent also maintaining Early Childhood Education (ECE) certification. An additional nine percent of the Pennsylvania VPK instructors hold master's degrees. Despite the high percentage of instructors with bachelor's degrees and ECE certification, the state standards set for VPK instructors are expected to rise to an even higher level as all VPK lead instructors were expected to possess a bachelor's degree and ECE certification by December of 2011 (p.9).

The report also stated that Pennsylvania VPK programs complied with or exceeded the recommended best practices set forth by NIEER. These best practices included: a) maintaining small class sizes, which yielded increased attention to individual students and improved relationships between students and instructors; b) engaging families and keeping parents apprised of student success; and c) utilizing progress monitoring to ensure students were making appropriate developmental gains (p.5).

In a separate report released by the State of Pennsylvania Office of Child Development and Early Learning (2011), the authors referenced the importance of common standards that provide program practitioners with a comprehensive set of indicators or benchmarks that the students are expected to master. Specifically, the State of Pennsylvania developed the

Pennsylvania Core Body of Knowledge (CBK). The CPK is a set of core competencies that early childhood instructors are expected to align their instruction to (p.2).

In addition to the utilization of core standards, the report also recognized instructor preparation, specialized professional development opportunities, and the formal education of instructors as variables that are positively correlated to a high quality program (p.2).

Furthermore, Pennsylvania has developed guidelines entitled Early Learning Keys to Quality. These guidelines were established to ensure early childhood programs were of high quality (p.3).

Bogard and Takanishi (2005) noted the importance of alignment and coordination of schooling from the age of three to third grade. To ensure this alignment and coordination, the researchers stated that students require systematic, coordinated, and age-appropriate experiences provided by trained instructors. Moreover, the authors reported that there must be a shared vision of what such a coordinated program is going to achieve. For example, a clear understanding of which curriculum is to be utilized, what outcomes are expected, and collaboration between instructors of the various grade levels are crucial components for a successful program (p.6).

Pianta et al. (2010) reported that in order to produce more effective student outcomes, students should spend increased time participating in instructor led learning activities. Pianta identified that students in early education programs spend a disproportionate amount of time participating in routine oriented activities instead of deliberate learning activities. Moreover, in comparing teacher led instruction against free-play (activities selected by the child) and teacher scaffolding (an activity in which a more knowledgeable person provides the student with assistance in solving a problem or explaining an activity), teacher led instruction demonstrated higher student outcomes when measuring student academic gains from fall to spring (pp. 1535-1536).

To ensure pre-kindergarten programs work at an optimal level, Gilliam (2008) reported that such programs should operate within a public school. It was stated that utilizing public schools as venues for pre-kindergarten programs is highly desirable due to the proximity and availability of special education services, the familiarity of the school environment that students develop, and the cost effectiveness afforded to the community by having a multi-use facility (p.125).

Gilliam also recommended that to truly provide community members with an efficient means of obtaining educational services, as well as the expanded services offered by programs such as Head Start, the notion of combining funding streams should be undertaken. This would allow parents to receive the benefits of both services in one fell swoop, instead of potentially having to elect for one service over another (p.126).

Frede and Barnett (2011) examined the attributes of what is regarded as one of the nation's most effective, state-funded pre-kindergarten programs. New Jersey's Abbott Prekindergarten program was established as part of a mandate issued by the New Jersey Supreme Court in 1998. The court ordered a number of educational reforms, one of which was the enactment of a universal pre-kindergarten program for all three and four-year-old children in the state (p.191). Some of the required components of the program included that each classroom would have no more than 15 students and a certified instructor and teaching assistant present. Furthermore, the program would offer transportation, a curriculum that was consistent with student's ability level, and health / other related services (p.192).

In addition to these requirements and adequate funding that the State of New Jersey dedicated to the program, the New Jersey Department of Education established a continuous improvement system, which monitored the progress of the VPK program. The system created a

uniform set of standards that all VPK programs were to abide by. What's more, the system also facilitated an effective communication system by which decision making could be coordinated across levels (state, local, school). Each level also ensured a system of continuous assessment. The state level utilizes a series of monitoring instruments that aim to measure student achievement in literacy and mathematics. Moreover, an instrument entitled the Early Childhood Environment Rating Scale is used in order to gauge the school environment (p.193).

At the district level, the Self-Assessment Validation System (SAVS) was established in order for local districts to identify areas of strength and weakness, then prescribe needed resources or improvement plans. At the classroom level, teachers utilize ongoing systems of assessment in which student literacy skills and emerging oral language skills are measured (p.195).

VPK as a Means of Closing the Global Achievement Gap

Despite the noted effectiveness of VPK as a vehicle for improving student academic achievement in the U.S., the U.S. continues to lag behind other industrialized nations in academic performance. A recent report from Frede and Barnett (2009) suggested that increased availability of pre-kindergarten for American students could act as a catalyst in closing the global achievement gap by as much as 20 percent (p.9). In recommending expanded VPK, if not free universal pre-kindergarten, the authors acknowledged the success of countries such as Norway, Singapore, Finland, and China, all of which provide universal pre-kindergarten at no cost.

It was reported that in addition to the universal pre-kindergarten offered by these academically high performing nations, the countries have also implemented standards that have been beneficial to the program participants. For example, in Shanghai's universal pre-

kindergarten program, all instructors are required to hold a minimum of a bachelor's degree.

Finland requires all public school instructors to earn a master's degree. Moreover, Finland's early childhood education is available to children beginning in the child's infancy. (p.9). In the United States, the majority of VPK programs are available only to students that are three or four years of age.

Early Childhood Education Globally

Comparatively, the early childhood education of American students is limited in scope when measured against early education programs throughout the world. Witte and Trowbridge (2005) conducted an extensive evaluation of United States early childhood education programs in comparison to the programs offered by other industrialized nations throughout the world. The authors of the study looked at the differences in program offerings by various governments, how the programs were funded, comparative program attendance rates, and program quality.

Regarding program offerings and quality, similar to the findings of the Frede and Barnett (2009), it was reported that the majority of European early care and education (ECE) programs are available at no cost to all children ages three to six. Furthermore, the programs are more uniform across Europe, as opposed to the highly varied programs throughout the United States. For example, in Germany, an education ministry facilitates the ECE program. Germany's program does stand out from other European countries in that they do require parents to pay part of the cost of ECE; generally from 16 percent to 20 percent depending on income level (p.7).

Compared to American children, European children take advantage of ECE programs at a significantly higher rate. At the time of this report (2005), American children between the ages of three and five years of age that come from impoverished homes were enrolled in pre-

kindergarten at a rate of 45 percent. American children between the ages of three to five years of age from higher income homes attended pre-kindergarten at a rate of 75 percent (p.3).

The report concluded that European ECE programs are of high quality, stating that education requirements for instructors are more rigorous than U.S. programs. What's more, the European ECE programs positively impact more students as they are available for a broader range of students. Often times, the European ECE programs offer children services for at least three years prior to students entering primary school. In addition to the benefits the children receive from the extensive European ECE programs, the mothers of the program participants benefit from the programs as well (p.32).

The maternal benefits come from various European governments that have established universal maternal leave policies that provide mothers with prolonged leave to enable them to tend to the health of their children (p.4). For instance, Finland offers 18 weeks of maternity leave and 26 weeks of parental leave. The parent that stays home can earn 70 percent of what they were earning prior to the leave (p.5). Burger (2010), also identified that one of the purposes of the German ECE program is to support parental participation in the labor market.

In rating the quality of early childhood education opportunities across economically advanced nations, the United Nations Children's Fund (UNICEF) released a report in 2008 that analyzed 25 member countries of the Organisation for Economic Co-operation and Development (OECD). The report rated the early education programs of the OECD countries based on 10 benchmarks. To be in compliance with all 10 benchmarks of quality, a country had to meet the following criteria: a) parents must be granted leave of one year at 50 percent of their salary; b) a national plan giving priority to economically disadvantaged children must be in place; c) subsidized and regulated child care services must have a participation rate of at least 25 percent

of children under three years of age; d) four-year-old children must participate at a rate of at least 80 percent in a subsidized and accredited early education program; e) 80 percent of all child care employees must be adequately trained; f) 50 percent of all early education instructors must be educated with relevant certification (e.g. bachelor's degree, state certification, etc.); g) programs must have a minimum staff to child ratio of one to 15 in pre-school; h) one percent of national Gross Domestic Product (GDP) must be allocated on early childhood education and related services; i) child poverty rate must be under 10 percent; and j) essential child health services must be nearly universal.

The United States fulfilled only three of the 10 benchmarks. Of the OECD nations, only Australia, Canada, and Ireland were ranked lower than the United States. Atop the list were Sweden (fulfilling all 10 benchmarks), Iceland (nine benchmarks), and Denmark, Finland, France, and Norway, who each fulfilled 8 benchmarks. The United States maintained compliance with regard to subsidized and regulated child care services for 25 percent of children under three years of age, 50 percent of staff in accredited early education programs with relevant qualification, and a minimum employee to child ratio of one to 15 in pre-school education (p.2.).

Despite the United States' compliance with only three of the 10 benchmarks established by UNICEF, when looking at the percentage of children between the ages of zero to three years of age that are enrolled in a child care program, the U.S. (approximately 35 percent enrolled) is above the OECD average of approximately 24 percent of children enrolled. Although the U.S. ranks higher in the number of young children receiving child care services, other high performing academic countries such as Denmark, Iceland, Norway, and Sweden have a significantly higher rate of participation among children of the same age (p.4).

As children progress from early age (zero to three years of age) into pre-school age (three to six years of age) the disparity between the participation of U.S. children in pre-school as compared to the children of other OECD countries becomes significantly apparent. Of three to six-year-old children in the U.S., just over 60 percent are enrolled in some form of pre-school. This ranks the U.S. 21st out of 24 economically advanced countries. The countries at the top of the list (France, Italy, Belgium, Spain, Iceland, and New Zealand) have nearly 100 percent participation in an early education program (p.5).

The UNICEF report also reinforced the importance of the allocation of federal dollars towards investment in early childhood education and childcare services that allow parents to return to work. The report concluded that the availability of childcare can positively impact GDP and tax bases, reduce poverty rates, decrease the number of welfare recipients, and increase returns on the investment in public education (pp. 8-9).

The UNICEF report went on to reference a number of studies conducted throughout the world that demonstrated similar findings to similar studies conducted in the U.S. regarding the positive impact of pre-kindergarten education programs. The report identified a Swedish study that found early childhood education had a positive long term effect on student academic performance at age 13. Additionally, a French study of pre-school students found that the longer children attended pre-kindergarten, the greater their results were as they progressed throughout grade school. The French study also reported that students from economically disadvantaged backgrounds displayed the greatest gains (p.10).

Looking to the effectiveness of the New Zealand Competent Children Project, the UNICEF report cited a 2004 longitudinal study that tracked the academic achievement of 12 year-old students in reading and mathematics. The New Zealand study concluded that students

that had participated in early childhood education programs performed at a higher level than non-participants. Moreover, the positive impact of the ECE program remained when taking into consideration family income and level of parent education (p.11).

A study out of the United Kingdom entitled the *Effective Provision of Pre-School Education* (2004) reported that participants in pre-kindergarten programs demonstrated heightened social and cognitive development. Specifically, it was written that students who began pre-school at a younger age (two to three years of age) generally experience increased cognitive development (p.26). Furthermore, it was reported that student achievement in the pre-school program was evident across socioeconomic classes (p.27).

A unique finding of this report that has not been present in a number of other studies was the discussion of gender inequalities in achievement. When attending high quality pre-school programs, it was reported that male students show a greater progression from their initial baseline assessment on number concepts. Despite the progression of male students, it was found that female students enter the pre-school programs with higher scores in most areas measured. This gender disparity could be based on gender differences in parenting methodologies (p.27).

Comparable to other studies, Cochran (2011) wrote on the differences of early childhood education implementation methodologies across the world. The author noted that although primary goals of early education (closure of the achievement gap between races, providing childcare for working mothers, preparation for primary school, etc.) in most societies are consistent, the manner in which they are offered and funded tends to vary based on competing political ideologies. For example, as previously discussed, some European nations provide extended government paid maternal leaves so mothers can spend adequate time with their

children. Other countries offer federally funded day care in an effort to get parents back into the workforce (p.67).

Although the success of the European models of ECE have been lauded throughout the review of various studies / reports, Cochran (2011) also presented a number of areas in which the European programs could continue to develop. Comparable to American early education programs, the report stated that European programs lack male instructors and instructors representing minority populations. Furthermore, it was stated that European educator preparation programs, although more extensive than most American early education programs, could benefit from additional specialization targeted at children of a specific age group (p.71).

An additional difficulty encountered within the European ECE system is the lack of uniformity amongst member nations of the European Union (EU). Neuman (2001) described these differences as centered around a set of differing ideologies as to what the purpose and structure of ECE should be. Specifically, Neuman referenced the difference between those that feel ECE should be a child-centered program that does not necessarily correlate to preparation from primary school and those that believe ECE should be designed in a manner that familiarizes students with the structure of primary school and emphasizes literacy, numeracy, and other skills that will prepare the student for later academic success (p.189).

Neuman reported that due to this lack of a cohesive plan for ECE programs, there has been a disconnect between primary school teachers and ECE facilitators. To ensure a more cohesive transition between ECE programs and student entry into primary school, Neuman postulated four strategies to strengthen the link between programs. The strategies include: structural continuity, pedagogical and program continuity, professional continuity, and continuity with home and community (pp.73-75).

Structural continuity refers to the idea that both primary schools and pre-kindergarten programs should be facilitated by the same department. Under this department, overarching goals and educator preparation expectations would be commonly understood (p. 73). Pedagogical and program continuity refers to a common goal found in United States VPK programs that focuses on providing students with skills necessary to ensure their readiness for entry to primary school (p.74). Professional continuity is the practice of having both primary school teachers and early education teachers trained together at the college level and then having additional years of training that are specialized by student age, similar to a medical student completing medical school and then completing a specialized residency (p.74). Continuity with home and community is simply ensuring that parents are regularly involved with the child throughout their time in the program (p.75).

To fund such extensive social services in some of the European nations, citizens are taxed at a higher level than their American counterparts. In Sweden, children from the ages of one to five are provided with full-time care and education in local neighborhood schools. In France, all children over the age of three are provided with universal pre-school services. In addition to the three-year-old children, approximately 35 percent of two-year-old children are provided with pre-school as well (pp.69-70).

Economic Impact of Early Childhood Education

A litany of studies and research reports examined for this literature review have found positive impacts of VPK on student academic achievement, improved student behavior, and student preparedness for kindergarten. Moreover, such early education programs have been found to be effective at the early identification of student disabilities and other afflictions that

require intervention. Non-English proficient students have shown growth academically and students with disabilities have also been shown to benefit. A consistent shortcoming of VPK programs in the United States is the long-term effect of the programs. In addition to the previously stated findings, a number of recent reports have focused on the potential or predicted economic impact such programs could have on the United States.

A policy brief composed by Dickens, Sawhill, and Tebbs (2006) of the Brookings Institute estimated that an investment in a high-quality, universal pre-school program could generate an additional \$2 trillion annually to the United States GDP by 2080. The authors estimated such a universal pre-kindergarten program would cost the federal government \$59 billion, however the return on the initial investment would more than cover the cost of the program.

Morrissey and Warner (2007) acknowledged the importance of pre-kindergarten programs and also endorsed additional funding for early childhood care services. The authors stated that an investment in such early childhood care and education programs is beneficial to society in that they allow parents to work, serve as cost effective interventions, and promote positive outcomes both academically and emotionally for children. Investing federal or state tax dollars in early education services and early childhood care was cited as a more effective manner of intervening than attempting to implement interventions later in life (p.57).

Lynch (2007) also cited the positive fiscal and societal impact of investment in pre-kindergarten programs. In his book entitled *Enriching Children, Enriching the Nation: Public Investment in High-Quality Prekindergarten*, it was stated that children who participate in high-quality pre-kindergarten programs demonstrate a lower rate of special education classification, a lower likelihood of repeating a grade, and less dependence on child welfare services. Regarding

the economic impact of pre-kindergarten programs, Lynch wrote that upon entrance to the labor force, former pre-kindergarten participants earn higher wages, which generates additional tax revenue. Furthermore, pre-kindergarten participants are less likely to commit criminal behaviors later in life, thus saving federal and state governments cost related to criminal justice and/or the housing of criminals (Executive Summary section, para. 2).

In studying the economic impact of state-funded pre-kindergarten programs across three states, Belfield (2005) estimated the fiscal effect an expansion of pre-kindergarten would offer the states of Massachusetts, Wisconsin, and Ohio. The researcher reported that due to the impact pre-kindergarten has on reducing the likelihood of student retention and placement in special education, states would save thousands of dollars. For example, in Massachusetts, a regular education student (over the course of their academic career) is expected to cost approximately \$55,000 based on the state calculation. In the event of a retention, that cost rises to over \$59,000 for the student. An average student classified as special education results in an estimated expenditure of over \$113,000 over the course of their academic career (p.7).

The study concluded that Massachusetts would receive a return of \$1.18 for every dollar invested in pre-kindergarten. Wisconsin's return on investment ratio would be a \$1.64 yield for every dollar spent and in Ohio, the state would expect to see a return of \$1.62 on every dollar invested in pre-kindergarten. Although the return rate of \$1.18 in Massachusetts seems low in comparison to the other two states, Massachusetts spent \$578 million on pre-kindergarten education during the time of this study, which resulted in an estimated return of \$683 million or a net gain of \$105 million (pp.12-13).

VPK in the United States: Moving Forward

As many states move forward with the allocation of additional dollars to VPK programs, a number of debates continue to emerge that will seemingly require additional research to validate the most effective approach to the implementation of VPK. Zaslow (2011) cited a number of topics related to VPK implementation that are presently being debated throughout the United States. The areas of concern include whether or not specific populations should be targeted for VPK or should such programs be universal and available to all. Moreover, the required level of credentialing of VPK instructors continues to be brought into question. Research reviewed for this writing discussed the benefits of increased teacher credentialing and certification as it relates to increased teacher retention and program continuity (Thomas & Lord, 2007; Zaslow 2011). The argument for targeted selection of specific populations is predicated on the view that since financial resources for VPK are finite, only the populations that stand to gain the greatest should be offered the opportunity to participate (Zaslow, 2011, p.209).

Kagan and Friedlander (2011) reviewed a number of studies which highlighted arguments for and against targeted selection of pre-kindergarten students. The researchers cited Gormley et al. (2005) who found that universal VPK programs showed positive gains for students from all social classes and racial groups that participated in the Tulsa, Oklahoma pre-kindergarten program. Moreover, multiple reports were cited that defended universal pre-kindergarten on the basis of the ease in gaining political support for programs that aim to benefit all (p.43).

Of shortcomings noted during the literature review, the most prevalent was lack of long-term impacts on student achievement. Brooks-Gunn (2011) stated the probability of a single year program (despite being of high quality) having long lasting effects on student achievement is unlikely. The author went on to report that the unlikeliness is due to the inability of a single year

program to overcome the detrimental impact of constant risk factors such as parents with low levels of education, exposure to poverty, and students residing in high crime areas (p.200).

Compounding the decrease in long-term effect on students that come from disadvantaged backgrounds is the rate at which these students attend lower quality schools after their pre-kindergarten program. Brooks-Gunn went on to state that most poor children attend schools that are located in impoverished neighborhoods. These schools tend to receive lower levels of per-pupil funding, have large class sizes, and teachers with little experience (p.205).

As researchers, educational leaders, and state lawmakers continue to find ways to ensure lasting gains in student achievement, a discussion of the length of pre-kindergarten programs is underway. Throughout the United States, the majority of pre-kindergarten programs are populated by four-year-old children, with a significantly smaller percentage of three-year-old children participating in pre-kindergarten. The 2011 NIEER report stated that in 2011, four percent of all three-year-old children participated in VPK throughout the United States. In comparison, 28 percent of all four-year-old children were enrolled in VPK (p.5).

Zaslow (2011) cited the need for extended student exposure to early childhood education programs. The researcher stated that brief (9 month) experiences in pre-kindergarten programs have not resulted in any significant findings indicating the positive impact of pre-kindergarten being sustained beyond the first few years of elementary school. Furthermore, Zaslow went on to report the importance of providing early educational services from infancy through age five. It was stated that early interaction with children through early education programs supports brain development, increases child expectations related to caregiving relationships, and improves verbal interactions (p.211).

CHAPTER THREE: METHODOLOGY

Introduction

The intent of this study was to determine to what extent, if any, did student participation in a VPK program had on the academic achievement and kindergarten readiness of the students that participated in the program in comparison to other students that did not participate in VPK. The methodology utilized to answer the research questions listed in Chapter One is presented in this chapter. This chapter is outlined as follows: (a) selection of participants, (b) data collection, (c) data analysis, (d) summary, and (e) limitations / delimitations (Lunenburg & Irby, 2008, p. 166).

Selection of Participants

This quantitative panel study utilized archival data made available by a large, suburban school district. The school district provided achievement scores of a cohort of students that participated in state-funded VPK during the 2006-2007 school year. Student names and other information that could identify student identity were provided to the researcher, however the student names and student identification numbers were omitted from this study. The rationale for providing the researcher with student names was due to the fact that the information requested by the researcher was only available in hard copy and said hard copies were given to the researcher on a temporary basis.

The entire sample of 222 students who participated a VPK program were utilized for the analysis. A separate sample of 221 students who did not participate in VPK was selected from the cohort. The students selected had their achievement scores on the Florida Kindergarten

Readiness Screener (FLKRS) compared, as well as their achievement scores on their 3rd Grade Florida Comprehensive Assessment Test Reading and Mathematics.

Data Collection

This study was conducted utilizing archival data made available by the school district. The student achievement scores on the Florida Kindergarten Readiness Screener (FLKRS) and the Florida Comprehensive Assessment Test (FCAT) Reading and Mathematics were procured from the school district's Department of Accountability and Assessment and the Special Projects department. Student achievement scores were gathered and analyzed from two groups. The control group consisted of students who did not participate in a VPK program. The treatment group was a group of 222 students who participated in a VPK program. The control group of 221 students who did not participate in a VPK program was selected by using a random number generator. All of the student data utilized in this study for both the control group and treatment group came from students that attended kindergarten and third grade at 20 elementary schools in the school district. The school district provided FLKRS scores on 2744 kindergarten students who were enrolled in the district's elementary schools during the 2006-2007 school year. The sample of 222 VPK participants and the 221 non-participants were pulled from the 2744 students.

When looking at this same cohort of students during to 2009-2010 school year to measure whether or not the VPK participants achieved on the FCAT Reading and Mathematics at a significantly higher level than the control group, it was determined that of the original 222 VPK participants that were measured, 116 remained at the same school within the district during the

2009-2010 school year. Of the 221 non-participants in the control group, 111 remained at the same elementary school during the 2009-2010 school year.

Prior to obtaining the data, permission was secured through a written application to the Deputy Superintendent of Instructional Excellence and Equity. The FLKRS scores obtained were from the 2006-2007 school year. The same groups of students had their 3rd grade FCAT Reading and Mathematics scores analyzed from the 2009-2010 school year.

Once the data were gathered, the student scores for the two groups were input into a data analysis program that provided appropriate statistical analysis that will be discussed in the ensuing Data Analysis section.

Data Analysis

The study utilized a quantitative method of data collection. The data analysis was completed through the use of an independent samples *t*-test. This method of analysis was employed as the researcher sought to determine the mean score of two separate groups and then compare the mean scores to see if there was a statistically significant difference between the means. After obtaining the data from the school district, the student scores selected were input into SPSS. For all three research questions, the mean scores of each group were compared utilizing the independent samples *t*-test. The research questions were as follows:

- 1) What is the difference, if any, in kindergarten preparedness between VPK participants and non-participants as measured by the Florida Kindergarten Readiness Screener?
- 2) What is the difference, if any, in student achievement on the 3rd grade Florida Comprehensive Assessment Test (FCAT) Reading between VPK participants and non-participants?

3) What is the difference, if any, in student achievement on the 3rd grade Florida Comprehensive Assessment Test (FCAT) Mathematics between VPK participants and non-participants?

Summary

This chapter reviewed the purpose of the study and re-stated the method in which the objectives of the study would be measured. The data for this quantitative panel study was obtained through the school district that requested the study. Prior to obtaining the requested data, permission was secured through a written application which was approved by the Deputy Superintendent of Instructional Excellence and Equity. The intent of the study was to determine if there was statistically significant difference in academic achievement and student preparedness for kindergarten between students who participated in VPK and non-participants. Student scores on the FLKRS and 3rd Grade FCAT Reading and Mathematics were compared using an independent samples *t*-test. The results of the data analysis will be presented in the following chapter. The limitations and delimitation of the study were as follows:

Limitations

- The school district retained archival data on student achievement on the FLKRS and FCAT scores of students who participated in VPK, however whether a student participated in a private pre-kindergarten, or VPK outside of the school district is not known.
- It is possible that students participated in a VPK program in the school district at age four and then went on to participate in kindergarten and third grade in the school district. The students could have enrolled elsewhere temporarily and received support that aided in their academic achievement.

- It was unknown what additional support some VPK participants received outside of school. Such support could have acted as a confounding variable and misrepresented the impact or lack thereof of VPK participation.
- The impact of the VPK program or lack thereof could have been mitigated due to outside socioeconomic and environmental factors that impacted the participants.
- Demographic differentiation between students as it related to socioeconomic status, race, and gender was omitted due to the fact that the information was not included in the data made available by the school district. It would have been possible to procure demographic information, however due to time constraints in completing the study, the researcher was unable to obtain such information.

Delimitations

The students selected for this study were delimited to the Seminole County School District.

CHAPTER FOUR: PRESENTATION AND ANALYSIS OF DATA

Introduction

This study intended to determine whether or not there was a statistically significant difference in student academic achievement and student preparedness for kindergarten between a treatment group of students that participated in VPK and a control group of students that did not participate in VPK. In order to measure the achievement of both groups, student test scores on the 2006-2007 FLKRS were obtained from the school district requesting the study. The same treatment group and control group had their achievement scores on the 2009-2010 FCAT Reading and Mathematics scores compared as well. The intent of the study was achieved by comparing the mean test scores of both groups. This chapter presents the findings of the data analysis for the three stated research questions.

Descriptive Statistics

Student Preparedness Variables

To determine the extent to which VPK participants and non-participants were considered prepared for kindergarten, results from the Florida Kindergarten Readiness Screener (FLKRS) were analyzed. The FLKRS combines student performance on the ECHOS, as well as the first two measures of DIBELS (letter naming and initial sound fluency). Table 2 provides data on scoring frequency on the ECHOS. Table 3 depicts a summary of descriptive statistics and *t*-test results. Table 4 provides data on letter naming frequencies, while Table 5 provides a summary of descriptive statistics and *t*-test results. Table 6 indicates frequencies of fluency levels, with Table 7 reports a summary of descriptive statistics and *t*-test results.

Table 2. Frequencies for ECHOS Scores by VPK Participant Status

Level	Non-VPK (<i>n</i> = 221)		VPK (<i>n</i> = 220)	
	#	%	#	%
Not Yet Demonstrating (ND)	26	11.8	24	10.9
Emerging/Progressing (EP)	93	42.1	98	44.5
Demonstrating (CD)	102	46.2	98	44.5

Table 3. Descriptive Statistics for t-Test, ECHOS Score by VPK Participation (N = 441)

Year	<i>M</i>	<i>SD</i>	95% CI	
			<i>LL</i>	<i>UL</i>
Non-VPK Participant (<i>n</i> = 221)	26.93	7.93	25.88	27.98
VPK Participant (<i>n</i> = 220)	27.07	7.68	26.05	28.09

Note. $t(439) = -0.19, p = .85$. CI = confidence interval, *LL* = lower limit, *UL* = upper limit.

Table 4. Frequencies for Letter Naming Scores by VPK Participant Status

Level	Non-VPK (<i>n</i> = 221)		VPK (<i>n</i> = 221)	
	#	%	#	%
High Risk (HR)	27	12.2	27	12.2
Moderate Risk (MR)	21	9.5	26	11.8
Low Risk (LR)	27	12.2	35	15.8
Above Average (AA)	146	66.1	133	60.2

Table 5. Descriptive Statistics for t-Test, Letter Naming Score by VPK Participation (N = 442)

Year	<i>M</i>	<i>SD</i>	95% CI	
			<i>LL</i>	<i>UL</i>
Non-VPK Participant (<i>n</i> = 221)	23.99	16.19	21.84	26.14
VPK Participant (<i>n</i> = 221)	22.99	17.09	20.72	25.25

Note. $t(440) = 0.63, p = .53$. CI = confidence interval, *LL* = lower limit, *UL* = upper limit.

Table 6. Frequencies for Fluency Scores by VPK Participant Status

Level	Non-VPK (<i>n</i> = 221)		VPK (<i>n</i> = 221)	
	#	%	#	%
High Risk (HR)	36	16.3	42	19.0
Moderate Risk (MR)	39	17.6	40	18.1
Low Risk (LR)	40	18.1	52	23.5
Above Average (AA)	106	48.0	87	39.4

Table 7. Descriptive Statistics for t-Test, Fluency Score by VPK Participation (N = 442)

Year	<i>M</i>	<i>SD</i>	95% CI	
			<i>LL</i>	<i>UL</i>
Non-VPK Participant (<i>n</i> = 221)	12.29	9.16	11.08	13.50
VPK Participant (<i>n</i> = 221)	11.10	9.00	9.90	12.29

Note. $t(440) = 1.38, p = .17$. CI = confidence interval, *LL* = lower limit, *UL* = upper limit.

Student Achievement Variables

To ascertain the long-term impact or lack thereof VPK had on participants, student scores on the 3rd Grade FCAT Reading and Mathematics were analyzed. Table 8 depicts frequencies of FCAT Reading levels. Table 9 provides a summary of descriptive statistics and *t*-test results. Table 10 provides frequencies of FCAT Mathematics levels, while Table 11 provides a summary of descriptive statistics and *t*-test results.

Table 8. Frequencies for Grade 3 FCAT Reading Levels by VPK Participant Status

Level	Non-VPK (<i>n</i> = 111)		VPK (<i>n</i> = 116)	
	#	%	#	%
1	8	7.2	9	7.8
2	4	1.8	10	8.6
3	33	14.9	33	28.4
4	53	24.0	55	47.4
5	13	5.9	9	7.8

Table 9. Descriptive Statistics for t-Test, Grade 3 FCAT Reading DSS by VPK Participation (N = 227)

			95% CI	
Year	<i>M</i>	<i>SD</i>	<i>LL</i>	<i>UL</i>
Non-VPK Participant (<i>n</i> = 111)	1,549.66	316.79	1,490.07	1,609.25
VPK Participant (<i>n</i> = 116)	1,496.47	307.45	1,439.93	1,553.02

Note. $t(225) = 1.28, p = .20$. CI = confidence interval, *LL* = lower limit, *UL* = upper limit.

Table 10. Frequencies for Grade 3 FCAT Math Levels by VPK Participant Status

Level	Non-VPK (<i>n</i> = 111)		VPK (<i>n</i> = 116)	
	#	%	#	%
1	4	3.6	6	5.2
2	6	5.4	8	6.9
3	29	26.1	35	30.2
4	42	37.8	42	36.2
5	30	27.0	25	21.6

Table 11. Descriptive Statistics for t-Test, Grade 3 FCAT Math DSS by VPK Participation (N = 227)

			95% CI	
Year	<i>M</i>	<i>SD</i>	<i>LL</i>	<i>UL</i>
Non-VPK Participant (<i>n</i> = 111)	1,603.92	275.27	1,552.14	1,655.70
VPK Participant (<i>n</i> = 116)	1,559.83	294.67	1,505.63	1,614.02

Note. $t(225) = 1.16, p = .25$. CI = confidence interval, *LL* = lower limit, *UL* = upper limit.

Testing the Research Questions

Descriptive and inferential statistics were utilized to answer the three research questions posed in this study. In each of the three research questions, an independent samples *t*-test was employed to determine the difference between the mean scores of the treatment group (VPK participants) and control group (VPK non-participants). In the first research question, three separate independent samples *t*-tests were conducted. The first *t*-test conducted in the first

research question measured the difference between student scores on the ECHOS, while the second and third *t*-tests conducted for the first research question measured the difference in student scores in letter naming and fluency. In addition to the *t*-tests, frequencies of ECHOS levels (Table 2), letter naming (Table 4), and fluency levels (Table 6) were also provided. For the second and third research questions, an independent samples *t*-test was also conducted in order to determine the difference in mean scores of student achievement on the FCAT Reading and Mathematics. Moreover, frequencies of student achievement levels on FCAT Reading (Table 8) and FCAT Mathematics (Table 10) were reported.

Prior to conducting the independent samples *t*-tests for each research question, the assumption of normality was tested. Normality is tested by calculating skewness and kurtosis. Skewness is defined as the degree to which potential outliers are causing a distribution to be asymmetrical and therefore, skewed (Lomax, 2007, p.68). This value should fall between -2 and 2. Kurtosis implies the amount of “peakedness” in the normal distribution. Is it shallower or steeper than a standard normal curve? This value should fall between -2 and 2 (Lomax, 2007, pp. 71-72). For the first research question, all of the groups met the criteria, with the exception of the high kurtosis score for the VPK group on the fluency variable. Independent *t*-tests are robust to the normality assumption, particularly among cases in which sample sizes are equal (such as in this analysis), so the violation was acknowledged, but the analysis to proceeded. Regarding the second and third research questions, all groups met the criteria of a normal distribution.

Research Question One

Question 1: What is the difference, if any, in kindergarten preparedness between VPK participants and non-participants as measured by the Florida Kindergarten Readiness Screener?

The first research question examined student results on the FLKRS. The FLKRS is designed to determine the level to which a student is prepared for kindergarten upon their entrance to primary school. Kindergartners take the FLKRS within their first 30 days of school. The FLKRS is comprised of two parts: the ECHOS and the first two indicators of the DIBELS (letter naming and initial sound fluency). On the ECHOS component of the FLKRS, student scores are categorized into the following groups: Not Yet Demonstrating (ND), Emerging / Progressing (EP), or Consistently Demonstrating (CD). The measures of the DIBELS classify students into groups of High Risk (HR), Moderate Risk (MR), Low Risk (LR), and Above Average (AA).

For the first research question, three separate independent *t*-tests were conducted. The first independent *t*-test on the student ECHOS scores yielded the following results: The *t*-test, $t(439) = -0.19, p = .85$, indicated that there was no significant difference in performance on this metric between VPK participants and non-VPK participants. VPK participants demonstrated a slightly higher average score on this measure ($M = 27.07, SD = 7.68$) than did non-VPK participants ($M = 26.93, SD = 7.93$); however, again, this difference was not statistically significant. Cohen's *d*, a measure of practical significance, was calculated to be .02. This indicates no effect in VPK participation status explaining the differences between students on this measure. According to Cohen's definitions, .20 is small, .50 is medium, .80 is large in terms of effect size.

The second independent *t*-test conducted for the first research question compared the mean scores of the control and treatment groups in letter naming. Students were scored based on the number of letters they could correctly name per minute. The independent *t*-test produced the

following results: The t -test, $t(440) = 0.63, p = .53$, indicated that there was no significant difference in performance on this metric between VPK participants and non-VPK participants. Non-VPK participants demonstrated a slightly higher average score on this measure ($M = 23.99, SD = 16.19$) than did VPK participants ($M = 22.99, SD = 17.09$); however, again, this difference was not statistically significant. Cohen's d , a measure of practical significance, was calculated to be .06. This indicates no effect in VPK participation status explaining the differences between students on this measure.

The third independent t -test conducted for the first research question measured the difference in mean scores between the control and treatment groups in initial sound fluency. The independent t -test results were reported as follows: The t -test, $t(440) = 1.38, p = .17$, indicated that there was no significant difference in performance on this metric between VPK participants and non-VPK participants. Non-VPK participants demonstrated a slightly higher average score on this measure ($M = 12.29, SD = 9.16$) than did VPK participants ($M = 11.10, SD = 9.00$); however, again, this difference was not statistically significant. Cohen's d , a measure of practical significance, was calculated to be .13. This indicates little effect in VPK participation status explaining the differences between students on this measure.

Based on the results indicated by the three independent t -tests conducted for the first research question, it was concluded that there is no statistically significant difference in student preparedness for kindergarten as measured by the FLKRS.

Research Question Two

Question 2: What is the difference, if any, in student achievement on the 3rd grade Florida Comprehensive Assessment Test (FCAT) Reading between VPK participants and non-participants?

The second research question compared the mean scores of the treatment group and the control group on the 3rd Grade FCAT Reading. Both groups were the same students who had their FLKRS scores analyzed in the first research question. The intent of analyzing the same groups of students was to determine whether or not there were any lasting effects of student participation in VPK. On the FCAT, students earn points on a Developmental Scale Score (DSS) based on the number of questions they correctly answer. Depending on the number of points earned, students were assigned a performance level of one through five, with one being the lowest level of achievement and five being the highest level of achievement. In the State of Florida, students who score at a level three or above are considered to be performing at an acceptable level. Students who scored at a level one or level two are required to take a remedial reading or mathematics course.

The independent *t*-test conducted yielded the following results: The *t*-test, $t(225) = 1.28$, $p = .20$, indicated that there was no significant difference in performance on this metric between VPK participants and non-VPK participants. Non-VPK participants demonstrated a slightly higher average score on this measure ($M = 1,549.66$, $SD = 316.79$) than did VPK participants ($M = 1,496.47$, $SD = 307.45$); however, again, this difference was not statistically significant. Cohen's *d*, a measure of practical significance, was calculated to be .17. This indicates little effect in VPK participation status explaining the differences between students on this measure. Frequencies of FCAT levels are provided in Table 8. A summary of descriptives and *t*-test results

are provided in Table 9. Regarding the second research question, it was concluded that there was no statistically significant difference in student academic achievement between VPK participants and non-participants on the 3rd Grade FCAT Reading.

Research Question Three

Question 3: What is the difference, if any, in student achievement on the 3rd grade Florida Comprehensive Assessment Test (FCAT) Mathematics between VPK participants and non-participants?

The third research question compared the mean scores of the control group and the treatment group on the 3rd Grade FCAT Mathematics. Just as in the FCAT Reading, students were assigned a DSS to determine their level of performance. The independent *t*-test yielded the following results: The *t*-test, $t(225) = 1.17, p = .25$, indicated that there was no significant difference in performance on this metric between VPK participants and non-VPK participants. Non-VPK participants demonstrated a slightly higher average score on this measure ($M = 1,603.92, SD = 275.27$) than did VPK participants ($M = 1,559.83, SD = 294.67$); however, again, this difference was not statistically significant. Cohen's *d*, a measure of practical significance, was calculated to be .16. This indicates little effect in VPK participation status explaining the differences between students on this measure. Frequencies of FCAT levels are provided in Table 10. A summary of descriptives and *t*-test results are provided in Table 11. It was concluded that there was no statistically significant difference in student achievement between VPK participants and non-participants on the 3rd Grade FCAT Mathematics.

Summary

In this chapter, an introduction was provided regarding the analyses that were conducted for each of the three research questions. Furthermore, a discussion of the variables that were measured was provided, as well as multiple tables which provided the results of each of the respective statistical tests which were conducted. To measure the difference in mean scores, independent *t*-tests were employed for each research question. In addition to the independent *t*-tests, descriptive statistics were provided for each research question. Regarding the first research question, the independent *t*-tests conducted determined that there was no statistically significant difference in student preparedness for kindergarten between the treatment group (VPK participants) and the control group (VPK non-participants).

The second research question exhibited similar results. The independent *t*-test conducted demonstrated that there was not a statistically significant difference in student achievement between VPK participants and non-participants as measured by the 3rd Grade FCAT Reading. The third research question reported the same findings, as it was determined that there was not a statistically significant difference in student achievement between VPK participants and non-participants as measured by the 3rd Grade FCAT Mathematics.

The ensuing chapter will present a summary of the study, as well as implications for practice and recommendations for further research.

CHAPTER FIVE: SUMMARY, DISCUSSION, AND CONCLUSIONS

Introduction

In the previous chapter, the presentation and analysis of data were reported. Chapter V will be replete with a summary of the study, a discussion of the study's findings, implications for practice, recommendations for future research, and conclusions.

Summary of the Study

This study aimed to ascertain to what extent, if any, did student participation in VPK have on student preparedness for kindergarten and student academic achievement. In order to determine whether or not there was a statistically significant difference in preparedness and academic achievement, two student groups were selected and analyzed. Utilizing archival data made available from the school district who commissioned the study, a treatment group of 222 students (VPK participants) and a control group of 221 students (VPK non-participants) were identified.

To determine whether or not one group outperformed the other group at a statistically significant level, student scores on the 2006-2007 FLKRS were compared. Students take the FLKRS within their first 30 days of kindergarten in an effort to determine their level of preparedness. To answer, the first research question, three independent samples *t*-tests were conducted to determine whether or not there was a statistically significant difference in student scores on the FLKRS. The FLKRS is comprised of two measures. The first measure is the ECHOS and the second measure consists of the first two indicators on the DIBELS (letter naming and initial sound fluency). The analysis determined that there was no statistically significant difference in the kindergarten preparedness between the two groups.

The second and third research questions sought to determine whether or not there were any lasting effects of VPK on student achievement. Achievement scores from the same treatment group and control group were examined from the 2009-2010 FCAT Reading and Mathematics. Of the original 222 students selected for the treatment group who had their FLKRS scores measured, 116 students remained in the school district in 2009-2010. Of the original 221 students selected for the control group, 111 students remained in the school district in 2009-2010. The analyses conducted determined that there was not a statistically difference in student achievement between the control group and treatment group on either the FCAT Reading or FCAT Mathematics.

Thus, the study concluded that there was no statistically significant difference in kindergarten preparedness between VPK participants and VPK non-participants as measured 2006-2007 FLKRS. Furthermore, the study concluded that there was no statistically significant difference in student academic achievement between VPK participants and VPK non-participants as measured by the 2009-2010 FCAT Reading and Mathematics. The researcher was unable to disaggregate the data by socioeconomic status, gender, Exceptional Student Education status, or ethnicity as the data provided by the school district only provided partial student identification numbers and test scores.

Discussion of the Findings

A multitude of recent studies have reported a statistically significant difference in student academic achievement and kindergarten preparedness between VPK participants and non-participants. Specifically, it was reported that VPK outperformed non-participants in a number of areas, which include but are not limited to: reading literacy, mathematics, and vocabulary (Lamy,

Barnett, and Jung, 2005; Suitts, 2010; Sylvester & Kragler, 2012). Moreover, student participation in VPK has been viewed as a catalyst in increasing future economic output, closing the achievement gap between ethnicities and social classes, and boosting the achievement scores of special needs students (Lipsey, Hofer, Bilbrey, & Farran 2012). The intent of this study was to determine if these same findings (increased academic performance and kindergarten preparedness among VPK participants) could be found in the school district in which the study was conducted.

Research Question One

What is the difference, if any, in kindergarten preparedness between VPK participants and non-participants as measured by the Florida Kindergarten Readiness Screener?

The results of the study showed that there was not a statistically significant difference in student preparedness for kindergarten between the control and treatment group. On the ECHOS, the first measure of the FLKRS, VPK participants showed a slightly higher mean score (M=27.07) than non-participants (M=26.93). On the first indicator of the DIBELS (letter naming), non-participants demonstrated a slightly higher average score (M=23.99) than VPK participants (M=22.99). Regarding the second DIBELS indicator (initial sound fluency), non-participants again demonstrated slightly higher mean scores (M=12.29) than the VPK participants (M=11.10).

These results are contrary to the findings of a number of studies examined in the literature review conducted for this study. Conceivable variables which could lead to the results reported for this study are the limited sample size and the socioeconomic status of the majority of the school district's residents. The school district in which the study was conducted is a large,

suburban district which includes pockets of impoverishment. Had the data related to student socioeconomic status been available, it may have reported that the two groups being measured were both products of middle to upper middle class neighborhoods. Students who reside in areas that do not suffer from impoverishment are often brought up in text rich environments that provide the students with access to resources that students from impoverished neighborhoods do not have.

Research Question Two

What is the difference, if any, in student achievement on the 3rd grade Florida Comprehensive Assessment Test (FCAT) Reading between VPK participants and non-participants?

The independent *t*-test conducted for the second research question reported that there was not a statistically significant difference in student achievement between the control group and the treatment group on the 2009-2010 FCAT Reading. VPK non-participants demonstrated a slightly higher average DSSS score (M=1549.66) than VPK participants (M=1496.47). These findings were commensurate with the findings of other studies, which have found the long term impact of student participation in VPK to have dissipated by the time the students reach third grade (Finn, 2009). As this analysis measured the difference in mean scores on the student's 3rd Grade FCAT Reading, it was not surprising that there was not a statistically significant difference in achievement.

Research Question Three

What is the difference, if any, in student achievement on the 3rd grade Florida Comprehensive Assessment Test (FCAT) Mathematics between VPK participants and non-participants?

Comparable to the findings of the first two research questions, the final independent *t*-test conducted for this study reported that there was not a statistically significant difference in student academic achievement between VPK participants and non-participants. Student scores on the 2009-2010 FCAT Mathematics were analyzed. VPK non-participants demonstrated slightly higher mean scores ($M=1603.92$) than VPK participants ($M=1559.83$). Again, as these results are from the 3rd Grade FCAT Mathematics, the lack of a significant difference in achievement is commensurate with previous studies that have noted VPK's lack of impact as studies progress through primary school.

Implications for Practice

States throughout the nation continue to invest millions of dollars in pre-kindergarten programs. As previously referenced in this study, expanding opportunities in early childhood education has demonstrated a significant return on investment in myriad studies conducted in both the United States and abroad. Although the results of this study indicated that there was not a statistically significant difference in kindergarten preparedness and student academic achievement between the control and treatment group, this should not alter the opinion of school leaders in the school district that requested the study.

The overwhelming majority of research on the impact of pre-kindergarten education, whether public or private, clearly indicate that early childhood education is beneficial to children

of all socioeconomic and ethnic groups. Whether acting as a vehicle in which to identify students in need of special needs services at an early age, or providing a student from an impoverished home with a stable, text rich environment, VPK is worth funding. Despite the recent emphasis on early childhood education and the expanded funding VPK has received of late, the United States still lags behind other modernized nations throughout the world.

In order to actualize the potential of VPK programs throughout the nation, school districts nationwide should allocate the necessary resources to ensure their VPK personnel, whether school level or district level, are provided with the opportunity to visit high performing VPK programs. Dufour, Dufour, Eaker (2008) championed the effectiveness of Professional Learning Communities (PLCs). Such PLCs have been implemented throughout elementary, middle, and high schools across the United States. These PLCs seek to improve instruction and professional practice through consistent and collaborative meetings between educators. During the literature review for this study, little to no research about the use of PLCs at the pre-kindergarten level was discovered.

Although the United States continues to sit atop the world as a leader in industry and innovation, other industrialized nations are taking measures to catch up and take their seat at the table. To remain a world leader, the United States must continually assess and attempt to determine which variables will lead us to continued prosperity. Among the variables responsible for the rise of the United States and now other nations, a focus on education is paramount. A common expression in the business world that has now entered the world of education is “what gets measured gets improved.” Similar to the traditional levels of public education (elementary, middle, and high), pre-kindergarten programs will continue to undergo additional scrutiny. This additional scrutiny has led to new metrics and other means of analyzing the impact such early

education programs have on student achievement. Hopefully, such analysis of VPK programs will allow school leaders to determine which variables demonstrate the highest correlation to VPK effectiveness.

Conclusions

The intent of this quantitative, panel study was to build upon previous research into the effectiveness of VPK. Furthermore, this study intended to provide school leaders within the school district who commissioned the study with usable data in which to better inform their decision making as it relates to VPK. To determine whether or not there was a statistically significant difference in student preparedness for kindergarten and student academic achievement, archival data made available from the school district was utilized. To measure the difference in student preparedness between VPK participants and non-participants, scores from the 2006-2007 FLKRS were analyzed. The independent samples *t*-test which measured the difference between the mean scores of the two groups reported that there was not a statistically significant difference between the control group and the treatment group.

In determining whether or not there was a statistically significant difference in student academic achievement between the VPK participants and non-participants, scores from the 2009-2010 FCAT Reading and Mathematics were analyzed. The independent samples *t*-tests conducted determined that there was no statistically significant difference in academic achievement between VPK participants and non-participants on the 2009-2010 FCAT Reading and Mathematics.

Recommendations for Further Research

The scope of this study was limited due to time constraints, the availability of student socioeconomic and demographic information, and the limited number of student scores to analyze. One of the limitations of this study was due to the district omitting the specific type and/or location of the pre-kindergarten the student attended. In order to determine whether or not the students in this study attended private or public pre-kindergarten, contact with the FLDOE had to be established. As the study had to be completed within specific time parameters, the researcher was unable to wait on FLDOE to provide the requested information. The following recommendations are suggested for those conducting further research:

- 1) In the event a researcher will require data from the State of Florida, or any other governmental agency for that matter, contact should be established immediately as to ensure that a delayed response on behalf of the organization does not limit the breadth of the study's findings.
- 2) It is recommended to the district that upon students entering the school system, parents indicate on the application the specific location their child attended pre-kindergarten and what organization provided the pre-kindergarten. As previously stated, for this study, FLDOE had to be contacted in order identify which pre-kindergarten program students attended. Keeping this information in house will allow more efficient access to this information to future researchers and the school district alike.
- 3) An additional recommendation for future research would be to utilize an increased sample size.

- 4) Moreover, it is recommended to analyze student preparedness data and achievement data from multiple school years to determine whether or not the effects or lack thereof are lasting.
- 5) To ascertain whether or not the effects are lasting as students approach high school graduation, it is recommended that the pre-kindergarten participants are tracked longitudinally.
- 6) To isolate the extent to which students who come from homes of lesser means are affected by pre-kindergarten, it is recommended to either isolate schools within the district that are populated by predominantly impoverished students or utilize preparedness and achievement scores from multiple counties from throughout the region. Utilizing scores from multiple districts would also allow for a larger sample size which could result in more generalizable findings.
- 7) Future research into the impact of pre-kindergarten on student preparedness and academic achievement could benefit from the use of a qualitative analysis. In having spoken informally with a number of kindergarten teachers throughout the duration of this study, the researcher was informed by multiple instructors that there was a noticeable difference in student performance between those who attended pre-kindergarten and those who did not.

The district in which the study was conducted is a very high performing district within the State of Florida. Moreover, the district is a suburban district, with a predominantly Caucasian population. The most recent data available from the United States Census Bureau reports that 81.6 percent of the population within the district is Caucasian, the Hispanic population is 17.7 percent, African American population 11.7 percent, and the Asian population 3.9 percent. 91.1

percent of the district's population has earned a high school diploma, while the median household income is \$58,908. Taking these statistics into consideration, it could reasonably be inferred that the majority of the students in this district who attend pre-kindergarten are coming from household environments that are resource rich. This could be a factor in the reporting of no statistically significant difference in student preparedness and academic achievement between the treatment and control group.

APPENDIX: UCF IRB



University of Central Florida Institutional Review Board
Office of Research & Commercialization
12201 Research Parkway, Suite 501
Orlando, Florida 32826-3246
Telephone: 407-823-2901 or 407-882-2276
www.research.ucf.edu/compliance/irb.html

Approval of Exempt Human Research

From: **UCF Institutional Review Board #1**
FWA00000351, IRB00001138

To: **Jordan J. Rodriguez**

Date: **November 02, 2012**

Dear Researcher:

On 11/2/2012, the IRB approved the following activity as human participant research that is exempt from regulation:

Type of Review: Exempt Determination
Project Title: The Impact of Voluntary Pre-kindergarten on the Academic Achievement of Free / Reduced Lunch Students
Investigator: Jordan J. Rodriguez
IRB Number: SBE-12-08791
Funding Agency:
Grant Title:
Research ID: N/A

This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made and there are questions about whether these changes affect the exempt status of the human research, please contact the IRB. When you have completed your research, please submit a Study Closure request in iRIS so that IRB records will be accurate.

In the conduct of this research, you are responsible to follow the requirements of the Investigator Manual.

On behalf of Sophia Dziegielewska, Ph.D., L.C.S.W., UCF IRB Chair, this letter is signed by:

Signature applied by Joanne Muratori on 11/02/2012 02:11:24 PM EST

IRB Coordinator

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