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In researching recent literature for this review, multiple searches were conducted including searches for class-size reduction, student-teacher ratios, cost-effectiveness, and districts that implemented class-size reduction programs. Gilman (1988) conducted research on Tennessee's Project STAR which served as a basis for continued research. Summative findings included student-teacher ratios, which are an integral part of student achievement, also guidelines for future class-size reduction programs were developed to improve learning experiences for young children.

Class Size:

Appropriate Student-Teacher Ratios

in Early Childhood Classrooms

in Relation to Student Achievement

A Graduate Review

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Over the years I've been blessed to have support from my family, friends, and educators. I'd like to thank those closest to me for always offering a supportive word, encouraging me in my studies, and empowering me to be a better person and teacher. From my earliest days growing up, I knew I could count on my family members to be my first teachers. Upon entering school, I was fortunate to have had great educators along the way who taught me to always want more. I credit my success in school to my support network. My network was comprised of my first and second grade teacher who inspired me to become a teacher, my college comp teacher in high school who taught me to write well, and my many professors throughout my college careers who taught me to never accept the status quo; I can make a difference.

I believe that knowledge is power, and in the past several years of my journey in education I've received much knowledge. It is my goal to apply that knowledge to my life, to my teaching, and in turn to my students' lives. I wish to instill in my students the same belief that my teachers instilled in me; you can be whatever you want to be.

I wish to dedicate this work to those who have helped me in my journey. You're appreciated more than you know, and more than words can ever say. Thank you for your unwavering support, guidance, and interest in my educational endeavors.

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CHAPTER 1

INTRODUCTION

Background

Schools nationwide are contemplating the issue of class size reduction as an effective measure to increase student achievement. This Class-Size Reduction (CSR) program, first authorized in PL 105-277, began in the Fiscal Year (FY) 1999, and it represented a major federal commitment to help school districts to hire additional qualified teachers in early elementary grades. This CSR program was authorized based on the belief that children learn best in smaller classes (U.S. Department of Education, 2004). The ultimate goal of this program was to improve student achievement, primarily in reading, by reducing class size in grades K-3 to a maximum of 18 students in each class at each grade level.

Individual states received portions of the $1.2 billion allocations, which were made available by the Department of Education Appropriations Act of 1999. The initial Appropriations Act of 1999 was reauthorized as part of the 2001 Elementary and Secondary Education Act of 1965 (ESEA), and it was used to then house the CSR program for Title II categorical funding. Funding for each state was based on a formula using poverty and enrollment data (U.S. Department of Education, 2004). As a result, individual states and their many districts had more flexibility to use their Title II, Part A funds to improve teacher quality and student achievement.

Rationale for Choosing Topic

I chose to research this topic because my school district is currently undergoing budgetary restraints, and one way administrators in my district alleviated cost was by reducing the number of sections of kindergarten through third grade classes. My district

currently receives class-size reduction dollars each year to aid in student learning. What is happening, however, is that monies are being spent on curricular items and student materials instead of additional classrooms. I chose to research this topic to find answers to my district's dilemma.

In recent years, best practice in early childhood classrooms has been a topic readily discussed among teachers, post-secondary instructors, as well as by early childhood specialists at state and national levels. *Best practice* is the term used to identify those operations in the classroom that speak to the nature of high quality programs, specifically those that are implemented in early childhood environments ages birth through eight. High quality programs are recognized by meeting the National Association for the Education of Young Children's (NAEYC) position on center accreditation standards. NAEYC provides guidelines to preschools nationwide on appropriate practice as well as on accreditation services, which indicates a program is of high quality. One aspect that NAEYC stresses is the need to insure high quality programs to have appropriate student-teacher ratios (NAEYC, 2005).

Purpose of the Study

The purpose of this review of the literature was to examine the effects of reduced class sizes in early childhood classrooms in relation to student achievement, and to present guidelines for implementing class-size reduction programs and practices in K-3 classrooms. Class sizes have been on the rise in recent years as a result of budgetary restraints from state to state. The cost-effectiveness of larger class sizes can be measured in two ways: (a) cost, and (b) student achievement. Consequently, the review of literature examined the effects of

small class sizes and student achievement (Achilles, 2003). To accomplish this purpose, this review of the literature addressed the following questions:

1. What are the benefits of class-size reduction programs?
2. What are the difficulties associated with class-size reduction programs?
3. What guidelines are needed in implementing best practice in K-3 classrooms related to student achievement and class size?

These questions will be discussed in the body of this paper. An analysis of the findings will result in conclusions and recommendations concerning class sizes for students and teachers in the Sigourney Community School District from kindergarten to grade three.

Importance of Review

Although NAEYC outlines what is best practice in class size ratios for children birth to age five, with age five as the typical entry age of kindergarten students; however, they do not recommend student-teacher ratios beyond that of kindergarten entry. It is imperative then, for districts to identify NAEYC's position statement for class size ratios for kindergarten, which is 1:10-1:12, and then increase student-teacher ratios accordingly as students advance into the lower and upper elementary grades. In NAEYC's position statement for teacher-child ratios, group sizes are stated as ceilings, regardless of the number of staff.

In discussing the issue of best practice within early childhood classrooms, educators are becoming more aware of student-teacher ratios, and the effect these ratios have on student achievement. Teachers in kindergarten through third grade need to identify what their student-teacher ratio is within their district and match ratio recommendations by NAEYC for kindergarten-aged students. In addition, these same teachers must adhere to the United States Department of Education's ratio recommendations for first through third grades, and provide

to their district evidence of best practice in regard to student-teacher ratio; if warranted, then make necessary changes. The NAEYC guidelines will provide novice and veteran teachers alike appropriate class sizes of students, who will demonstrate needed academic achievement in early childhood classrooms.

Limitations

Although NAEYC does not accredit state-operated schools, the information provided by this national association should be considered by district officials. At the time of research for this review, NAEYC had redesigned its national accreditation program, making it more rigorous to receive, and student-teacher ratios were discussed, primarily at the kindergarten level. In addition, many states have begun to add universal preschool programs to their district's operations; however, information disseminated by NAEYC is vague concerning the role of district officials, creating a gap in knowledge and best practice. Districts need certified teachers in the early childhood grades, kindergarten through third, to insure best practice is maintained, and some districts do not yet see the need, or have resources, to fill these positions with highly qualified individuals (U.S. Department of Education, 2004). Therefore, best practice is not always being implemented in state-funded programs, and neither are they of the highest quality. One way to insure high quality is to follow NAEYC's recommendations in all areas, including student-teacher ratio.

Another limitation of this review was access to primary sources. At times, some sources were not available for review, and therefore, limited an extensive review of some studies about student achievement and class-size reduction. Consequently, when primary sources were not available, secondary sources were used.

Definitions

Within the literature for this study, various terms were used interchangeably. *Class size*, *average class size*; *student-teacher ratio*, *pupil-teacher ratio*; *class-size reduction*, and *class reduction* were terms used synonymously. For clarity and understanding the following terms are defined in the following way:

Average class size: The average number of students at a grade level. The district's average class size may be 17:1, but the standard deviation of this average score is +10, meaning classes within the district may have as many as twenty-seven students, making the ratio 27:1, or as few as 17:1.

Certified Annual Report: In Iowa, the Certified Annual Report is the report each district must complete and send to the state department of education at the end of each fiscal year. This report discusses annual expenditures.

Chronological age: The age in which children are based on their birth date. In discussing kindergarten entry, many states assign a date in which a child must be age five on or before such date in order to enter school; this is known as their chronological age, and is often used to measure norms on developmental tests in early childhood classrooms.

Class reduction: The process of reducing class sizes to create a lower student-teacher ratio. This process creates more jobs, filled by certified teachers, which fosters positive outcomes.

Class size: The number of students assigned to one teacher.

Class-size reduction (CSR): The process of reducing class sizes to create a lower student-teacher ratio. This process creates more jobs, filled by certified teachers, which fosters positive outcomes.

Developmental age: The age in which a child exhibits particular developmental skills in various domains, placing children on the developmental continuum.

Distributed leadership: The perspective that leadership is not simply a function of what superintendents do in districts or what principals or assistant principals do in schools; instead, educational leadership involves practices of multiple individuals and occurs through the complex network of relationships and interactions among the entire staff of the school.

Fulltime educators: Fulltime educators are those persons working in schools that hold a teaching license, and who are employed as a teacher in any area.

National Association for the Education of Young Children: A national association of early childhood teachers, program directors, students, and early childhood advocates who work toward quality educational practices for children ages birth through eight.

Proficient teachers: Teachers who hold a teaching certificate, but not endorsements in the areas in which they teach.

Quality-adjusted life-years: The study of quality of life attached to the STAR Project. Researchers applied statistical formulas to adjust for quality of life based on normative data related to cost of living, educational background, etc. Further, researchers compiled data to assign life-years to a participant's life as a result of having been a participant in a CSR program in grades K-3. The life-year number was 1.7 years for each year of participation.

Quality teachers: Teachers who hold a teaching certificate, and who are endorsed in the areas in which they teach.

Student-teacher ratio: The relationship in numbers between students and teachers within one classroom.

CHAPTER 2

REVIEW OF THE LITERATURE

Class size has become a controversial issue plaguing many districts nationwide. President Bush's educational reform known as *No Child Left Behind* in 2001 mandated that teachers and schools be held accountable for student learning to a greater degree than in past years. Many educators today believed that one way of securing accountability for teachers and districts, while improving student learning, was to reduce class size. Proponents of small class size believe that these more intimate settings and relationships with students fostered greater learning and will close the achievement gap. Opponents, however, argue that small class size will not be cost-effective. Also, they maintain that schools should offer educational programs to minimize the achievement gap, rather than employing a greater number of teachers to carry out the same function. The case for or against small class size in American classrooms, warrants further study and inquiry in order to prepare our students for today's global society. The following discussion provides information for this study. First, identification of benefits associated with class-size reduction is presented. Then problems associated with reducing size class are discussed.

Benefits of Class Size Reduction

Proponents of class size reduction uphold the notions that students, teachers, schools, and communities benefit from reduced class sizes. They argued that schools today have the responsibility of teaching many academic and social skills to students who once possessed these skills upon entering school, and therefore require smaller class sizes for more intimate, individualized classroom settings to teach the necessary skills (Achilles, 2003). Further, proponents stated that student achievement increased as a result of more individualized

classrooms. They also argued that reduced numbers of students increased time on task, increased awareness of self as a learner, and increased positive behaviors as opposed to negative ones (Achilles, 2003). Proponents of class size reduction also asserted that the health and wellbeing of students was a high priority, claiming reduced class sizes increased high school graduation rates, increased college graduation rates, and in turn produced competent citizens who led more productive, fulfilling lives (Muennig & Woolf, 2007/8).

In addition, proponents of class size reduction believe the benefits far outweigh the costs of implementation. Proponents argue that the cost of implementation is low when weighed against the positive outcomes such as programming for students, the health and wellbeing of students, and the increased student achievement throughout academic and specialty areas. Researchers found evidence that students have a greater sense of community within smaller sized classrooms, and are better prepared for the global world upon graduation (Achilles, 2003; Biddle & Berliner, 2002; Handley, 2002). In addition, researchers observed students in a smaller classroom settings exhibited confidence and were more involved in curricular studies; the watered-down approach in larger classrooms was nonexistent (Handley, 2002).

Programs and Practices Conducive to Learning

School programming was addressed in terms of short and long term benefits for students participating in CSR programs. Achilles (2003) and Biddle and Berliner (2002) discussed the composition of schools in America today who implemented CSR programs. Achilles found that five theories related to benefits of class size reduction programs included: (a) learning, (b) teaching, (c) classroom, (d) other, and (e) student behavior (Achilles, 2003). For those schools participating in CSR programs, students, parents, and teachers saw

measurable outcomes indicative of school success directly related to lowered student-teacher ratios. Schools showed positive changes in the areas of: (a) academics, (b) behavior/discipline, (c) citizenship/participation, relationships, and (d) development and self concept growth as a result of implementing CSR programs (Achilles, Finn, & Pate-Bain, 2001).

Lowered student-teacher ratios contributed to school success for many students in CSR programs. In Achilles, Krieger, Finn, & Sharp's (2003) qualitative research findings, they discussed how districts that implemented CSR programs had classroom atmospheres that were conducive to learning for all students. These classrooms had better air quality, greater number of supplies and materials, increased space per student, and decreased noise levels. The classrooms were characterized by a sense of community in which all students had personal attention. In addition, students with special needs were included in regular education classrooms more so than they were pulled out in special education classrooms. The most important practice implemented by CSR programs in schools was classroom management. In addition, class size reduction programs have led to higher levels of teacher success as well. In a quasi-experimental research design, Ehrenberg, Brewer, Gamoran, and Willms (2001) found that teachers in districts implementing CSR programs in grades K-3 were better equipped to manage classrooms, and as a result, increased student success was characteristic. Teachers were able to individualize accommodations for students with special needs, offer early diagnoses and remediation of learning difficulty, and provide immediate reinforcement to students. Teachers also planned coherent lessons, with seamless transitions, which increased participation, engagement, and peer interaction in a cooperative learning

atmosphere which contributed to the success and achievement of teachers and students (Handley, 2002; Achilles, 2003).

The five dimensions of benefits related to class-size reduction programs presented by Achilles (2003) were characteristic of short term goals. The long term goals, however, associated with CSR programs are those that benefit students, teachers, and communities in the years following CSR program implementation. Long term benefits of CSR programs included higher graduation rates of students both from high school and from college, as well as an increased sense of fulfillment and adulthood happiness (Muennig & Woolf, 2007/8). The physical benefits of CSR programs are associated with the health and wellbeing of students as they work through the program and continue throughout their educational careers, and into adulthood.

Health and Wellbeing

Researchers Muennig and Woolf (2007/8) found reduced class size to have long term benefits for students. They did longitudinal research by following a portion of the 12,000 students who were part of Project STAR (Student Teacher Achievement Ratio) from 1985 to present-day and discovered commonalities among students who participated in this project. These commonalities included higher graduation rates, which led to an increased number of college students and graduates. Muennig and Woolf then hypothesized that high school and college graduates were more likely to lead happier, and more fulfilling lives. Also, they stated that those individuals participating in the class size reduction program, STAR, who graduated from high school and college, had increased lifetime earnings and improved health than students who learned in higher student-teacher ratio classrooms. Earnings were targeted to be worth $170,000 for average students and $196,000 for those students who received free

and reduced lunches during the operation of Project STAR. In addition, quality-adjusted life-years were discussed for student participants. It was estimated that each student who participated in CSR programs in grades K-3 had an increase of 1.7 life-years for each year as a participant. In other words, four-year student participants may see an increase of 6.8 life-years as a result of participating in CSR programs. Muennig and Woolf (2007/8) hypothesized that participants in CSR programs were less likely to require governmental assistance such as Medicare or Medicaid in adulthood. Thus, the same authors concluded the results of implementing CSR programs were statistically significant from a societal perspective.

Student Achievement

Supporters of CSR programs have noted an increased interest among various stakeholders in recent years. With the standards movement associated with the *No Child Left Behind* Act of 2001, schools acknowledged a need for school reform that would aid in the success of all students. The reform most often cited was class size reduction (Biddle & Berliner, 2002; Ehrenberg, Brewer, Gamoran, & Willms, 2001; Cuseo, 2007). Tennessee's Project STAR, Indiana's Prime Time, and California's CSR program paved the way for new class size reduction initiatives that are currently being implemented across the nation (Gilman & Kiger, 2003, Noll, 2007). Wasley (2002) discussed how new programs, funded by the Bill and Melinda Gates Foundation and the United States Department of Education, separately, have committed $375 million combined, to fund small-school initiatives. These new programs in Boston, Chicago, Seattle, Oakland, and New York are believed to aid in the success of all students K-12 and demonstrate progress on state's standardized tests while preparing students for a global society (Wasley, 2002).

Proponents of class size reduction argued that student achievement was directly related to smaller class sizes (Achilles, Krieger, Finn, & Sharp, 2003). Achilles et al. (2003) conducted three additional studies focused on CSR programs and their effectiveness. After having conducted observations of CSR classrooms, the authors stated that improved student learning was characteristic in programs where class sizes were reduced to no more than 18 students per class; most classes had 13 or 14 students. Further, in classes where student-teacher ratios were lowered, student achievement was aided by a variety of classroom and building level practices. Students learned task induction and worked toward mastery of basic skills as a result of time on task and developmentally appropriate practice and homework (Achilles et al., 2003). In addition, Gilman and Kiger, (2003) in a meta-analysis of CSR programs, observed that students who participated in Tennessee's Project STAR performed significantly better on all sets of achievement measures, and that the benefits of CSR occurred regardless of school location or student gender. Furthermore, academic achievement was greater for minority students and students who attended inner-city schools (Gilman & Kiger, 2003). Effective classroom teachers and learning environments were contributing factors that were conducive to the overall success of students in CSR classes. Moreover, authors Achilles et al., (2003) and Gilman and Kiger (2003) found CSR programs to show statistically significant findings in terms of student achievement, as well as teacher and student satisfaction in terms of the learning environment.

Student success also resulted, in part, from parent interest and involvement (Achilles et al., 2003). Schools that implemented CSR programs saw increased parental involvement which in turn reduced grade level retention. Also, parents took more interest in their children's education in smaller class sizes, and worked closely with classroom teachers to

supplement classroom teaching, therefore reducing the tendency to retain students (Achilles et al., 2003). Cuseo, (2007) in his meta-analysis of larger class size, noted that academic achievement (learning) and academic performance (grades) were lower in classes with large class size. Researchers found that lower performance and thus lower achievement were indicators of students who were retained in all grades, a direct result of larger class sizes (Achilles et al., 2003, & Cuseo, 2007).

Student achievement may be attributed to length of time in CSR programs. Finn, Gerber, Achilles, & Boyd-Zaharias (2001) discussed the reexamination of Tennessee's Project STAR for grades K-3 which was begun in the 1980s. In this respect, Finn et al., (2001) concluded three findings from the reexamination of data, they included: (a) students in smaller classes performed better than students in larger classes and larger classes with a teacher aide, (b) the year in which a student enters a CSR program and the amount of time spent in the program were important mediators of the benefits gained, and (c) few if any academic benefits were associated with the involvement of a full-time teacher aide. Similar to the findings of Finn et al. (2001) were ones contributed by Smith, Molnar, and Zahorik (2003) who evaluated Wisconsin's Student Achievement Guarantee in Education (SAGE). Smith et al. (2003) found the SAGE CSR program was beneficial for all students in grades K-3, especially low-socioeconomic and minority students. The SAGE program, first implemented in 1996, was designed to increase the academic achievement of low-income students by reducing K-3 class size to 15 students to each teacher; it also established *lighted schoolhouses* that were open longer than the traditional school day; also, it required more rigorous curricula, and structured professional development and accountability for school professionals (Smith et al. 2003). Students who participated in the SAGE program showed

25-30 percent of a year's growth by the end of first grade. In grades 2 and 3, students who remained a part of the SAGE program continued to see growth similar to that in first grade, but slightly lower. The results of the SAGE program were beneficial for all students, showing a one-third to one-half a year's full growth throughout the targeted grade levels (Smith et al. 2003).

Problems Associated with Class-Size Reduction Programs

Opponents of class size reduction contended that a need for small class sizes did not exist. They maintained that the cost-effectiveness of CSR programs was not conducive to district's budgetary restraints (Januszka & Dixon-Krauss, 2008). Furthermore, opponents upheld the notion that districts hire *quality* teachers versus *proficient* teachers to ensure that students received quality educational experiences, therefore, reducing the need for additional teachers. Opponents argued that curricula were the greatest benefit to students, not additional faculty and staff. Scientifically-based curricula were what many district officials, who supported CSR programs, called for when community members advocated for smaller class sizes. Quality teachers and scientifically-based curricula were components of the opposition's defense in regard to CSR.

Opponents of CSR programs argue that quality curricula not reduced class sizes leads to improved student achievement. Opponents urged that districts look closely at curricula that are being implemented, and not just at the size of classroom ratios. In so doing, districts can gauge the effectiveness of individual curricula. If students lack academic growth because of an outdated or ineffective curriculum, districts may replace the weakening curriculum to enhance student learning, and thus improve student achievement. Another practice districts implement is adopting research-based curricula with demonstrated positive effects.

No Child Left Behind 2001 had as one of its expectations scientifically-based research, assessment, and curriculum, which is deemed best practice by today's educators. Opponents of CSR programs argued that districts needed to look closer at their instructional practices and curriculum before implementing a CSR program. Scientifically-based curricula were what many opponents suggested would enhance student learning, not smaller class sizes. Wilde (2004) discussed NCLB's definition of scientifically-based research that was used to identify and disseminate conclusive information on *what works* in education, with an emphasis on determining what instructional input (curricula, instructional techniques) worked to increase student outcomes such as academic achievement and language proficiency.

The opposition to CSR programs contended that scientifically-based curricula and improved teacher quality are the answers to communities requests for smaller class sizes. Opponents felt restructuring current practices and methodologies within districts was the answer to implementation of CSR programs, as well as reframing teachers' pedagogical beliefs about what is developmentally appropriate educational experiences for students in the K-12 environment (Wilde, 2004).

Opponents also felt that class size reduction is not cost-effective. Opponents found that implementing new research-based curricula and enhanced professional development for teachers proved to be more cost-effective than implementing CSR programs. Those who staunchly opposed small class sizes did so out of budgetary demands more than out of consideration for what other viable options were available for their individual districts (Kennedy, 2003). Many times those who opposed class size reduction were those in administrative positions, those who served on school boards, and those policymakers who

allocated monies on a per-pupil basis; basically, they watched the bottom dollar in regard to local spending, for they are held accountable by the public for school expenditures.

Student Achievement

Opponents of CSR sought to clarify that student achievement was not directly related to lowered student-teacher ratios in all projects implemented (Gilman & Kiger, 2003). Rather, individual states and districts that implemented CSR programs differently found student achievement to have risen from the first to the second year of its operation, but then to have decreased by up to 50% in long term studies where students were tested after completing the four-year CSR program in grades K-3 (Gilman, 1988; Gilman & Kiger, 2003; Jones & Gilman, 1993). Consequently, research conducted showing long term benefits of student achievement were thwarted by opponents of CSR programs on the basis that students' overall academic success was short term, and students who participated in CSR programs in K-3, when measured against peers upon entering fourth grade, showed no heightened academic success because of having participated in CSR programs (Gilman & Kiger, 2003). Johnson (2002) suggested that student achievement was not the direct result of smaller class sizes, but rather, a result of strong instructional support. Also, Johnson in this same article, mentioned that when analyzing data to see widespread significance of reduced class size initiatives, students in fourth grade performed on average no better than students who attended classes with students numbering as high as 35:1 in grades K-3. In his analysis, Johnson's (2002) research took into account the following factors when analyzing data: (a) class size, (b) race and ethnicity, (c) parents' education, (d) the availability of reading materials in the home, (e) free and reduced-price lunch participation, and (f) gender. Upon analyzing the data in greater detail, Johnson found no difference in reading achievement

between students in small classes and students in large classes one year after complete CSR programs, and therefore, the results were statistically insignificant in terms of class size (2002). Further, Gilman and Kiger, (2003) in a meta-analysis of CSR programs, and Graue, Hatch, Rao, & Oen, (2007) in a qualitative study of CSR programs, noted that student achievement was not heightened because teachers who implemented CSR classrooms showed little evidence of change in teaching style than in previous years when teaching larger class sizes. As a result, opponents of CSR programs stress the style of teaching as more important than smaller classes as an indicator of quality classrooms.

Student achievement is directly related to a teacher's style of instruction (Gilman & Kiger, 2003). In CSR programs implemented in Indiana and Tennessee, student achievement rose in lower elementary grades, but decreased overall when entering fourth grade. Opponents of CSR programs argued that student achievement decreased as a result of teacher instruction. In a qualitative study conducted by Gilman, (1988) it was found that teachers' styles dictated the extent to which individual attention was given to each student, in and out of CSR programs, and that teachers generally taught the way they were taught. Furthermore, teachers did not implement current practices and procedures. Consequently, CSR programs were limited in their benefits because teachers did not alter their method of instruction, and continued to teach in the same manner they used to teach larger class sizes.

In a correlational *ex post facto* research design, results yielded that student achievement in CSR programs did not show lasting results because teacher attitude toward learning did not change, and because instructional time was not increased on an individual basis to the extent where increased learning took place (Jones & Gilman, 1993). Gilman (1988) discussed how schools that implemented CSR programs did so to increase student

achievement by reducing the ratio of students to teachers. What resulted, however, were smaller class sizes with teachers who implemented the curricula in the same manner in which they had done in previous years. In addition, Gilman (1988) hypothesized that the positive effects of CSR programs, in terms of academic achievement, may be limited to the early primary grades, and not beyond. Therefore, researchers suggested that reduced class sizes, although seemingly beneficial for students and teachers, had a greater cost of implementation in comparison to positive results reaped.

Cost of Funding Class-Size Reduction

Education is viewed as a necessity by most regardless of country of origin. Expenditures on education per school district, however, are vastly different, as are the roles of schools, students, and parents. Gilman (1988) produced a qualitative study twenty years ago that is still a current topic of discussion. The topic of study was reduced class size programs and why they were not working. Gilman's research produced evidence that supports opponents' views of class size reduction noting that benefits were minimal and costs were astronomical.

Gilman's review included interviews, observations, and data analysis that gave an intimate look into who wants class size reduction; who doesn't, and why; the effects of class size reduction; and the hidden costs of reduction in schools and districts (1988). In addition, Gilman noted in his findings that parents, although quick to agree that small class size was important to them, were just as quick to vote for maintaining the status quo for taxes; no increase in taxes meant no increase in teachers and subsequent teacher pay. Gilman also found that teachers, like parents, were in favor of small class sizes, regardless of scientific research which stated little to no positive gains in student achievement for CSR programs.

In states like California, as a result of class size reduction legislation, negative effects on student achievement were acknowledged (Johnson, 2002). The negative effects experienced were a direct result of *proficient* teachers filling the positions where *quality* teachers were needed. Furthermore, policymakers agreed with district officials with the need for quality educators in the field, but questioned the feasibility of states' abilities to produce enough teachers to fill vacant positions created by CSR programs. States that implemented class size reduction programs, such as Indiana, Tennessee, and California, soon found themselves with a need for qualified teachers as well as the need for monies to pay them. States reported costs skyrocketing to nearly $19 billion for one academic year, some twenty years ago (Gilman, 1988).

Schools currently implementing CSR programs have done so with state aid, federal aid, and through established grants such as the Gates foundation. Florida's sweeping legislation in November of 2002 amended the state's constitution, mandating schools enact class size reduction practices K-12, not just in lower grades as other CSR programs suggested. Just as in Indiana, Tennessee, and California, Florida found a need for monies and qualified teachers to fill the positions legislated by the state's highest governing body (Kennedy, 2003). Florida education officials stated they needed $628 million the following year to hire the 7,800 additional teachers to reach the state's goal of a maximum of 18 students per classroom in grades K-3, which was where their focus first began, with grades 4-12 to follow. The $628 million asked for by state education officials was solely for teachers' salaries; they requested additional monies for facilities and renovations (Kennedy, 2003). Additional monies requested to implement the state-wide CSR program in Florida increased

from $468 million in 2003-2004 to $2.6 billion in 2007-2008 (Florida Department of Education, 2009).

The opposition to class size reduction programs identified that the cost-effectiveness of implementing such programs is not conducive to state and federal allocations for school funding. Opponents felt, rather than change the composition of schools and districts, education officials needed to place more focus on various ways to enhance current practices. Ways to enhance current practices stated by Kennedy (2003) mentioned extending the school day or school year to provide students with more academic time, providing additional training for teachers, and using technology more effectively to individualize student instruction, rather than of hiring additional staff to carry out the same functions. Many opponents to CSR programs may agree with Kennedy's (2003) findings that the cost-effectiveness of CSR programs outweigh the feasibility of its implementation.

Accountability, Collaboration, and Distributed Leadership

The federal class-size reduction effort, begun by the Clinton Administration in fiscal 1999, allocated funds with a goal of helping districts hire 100,000 new teachers. The Bush Administration's *No Child Left Behind* Act incorporated the federal class-size reduction program into a block grant program to improve teacher quality. Ganley, Quintanar, and Loop (2007) suggested that teacher quality was the solution to the century-old quandary of school effectiveness. They noted that in order to improve teacher quality three areas needed to be addressed by all school districts: they included (a) accountability, (b) collaboration, and (c) social justice.

These same authors went on to discuss accountability as part of the *No Child Left Behind* Act of 2001. Accountability of students, teachers, and districts was at the forefront of

their research, linking it highly to student achievement. They mentioned the second characteristic of effective programs as collaboration by teachers. When collaboration was the primary focus of teaching all students gained. Ganley et al. (2007) noted that collaboration was the cornerstone of learning because educators were able to cooperatively work toward common goals while simultaneously respecting individual needs, strengths, and differences. Further, collaborative teaching enabled school personnel to divide work into manageable chunks, and conquer the obstacles of overloaded curriculum frameworks and high-stakes tests, all while holding each other accountable (Wild, Mayeaux, & Edmonds, 2008). As a result of teacher collaboration, districts saw a greater awareness of social justice, such as greater cooperation and support among their faculty and students. Districts that identified the need for improved teacher quality showed greater emphasis on core beliefs of learning, as well as an increased awareness of what best practice is in education today (Ganley et al., 2007; Wild et al., 2008). Some schools, as a means of best practice, are implementing core teacher teams. These teams work collaboratively to address content related issues, as well as ways to raise student achievement (Scribner, Sawyer, Watson, & Myers 2007).

Researchers Scribner, Sawyer, Watson, & Myers (2007) explored the concept of distributed leadership as it related to teacher teams. The authors' qualitative study used a constant comparative analysis and discourse analysis to explore leadership as a distributed phenomenon. Scribner et al. (2007) found three constructs emerged that informed the understanding of collaborative interaction within each professional learning team: (a) purpose, (b) autonomy, and (c) patterns of discourse. The authors hypothesized that purpose and autonomy manifested as organizational conditions largely shaped patterns of discourse

that characterized the interaction of team members. Meaning, individual teacher's purpose and autonomy directly relate to a team's social distribution of leadership.

Scribner et al. (2007) concluded that teachers, while working on professional learning teams, should consider how the scope and nature of a team's challenge and charge can influence team functioning within the group and in relation to the greater organization. The same authors discussed how implementing distributed leadership frameworks led to greater collaboration among teachers, administrators, and school board members, as well as to greater accountability. Teachers who participated in professional learning teams noted how their collaborative work influenced classroom teacher, and thus student achievement.

As Ganley et al. (2007), Scribner et al. (2007), and Wild et al. (2008) discussed through research findings, student achievement can be increased through improved teacher quality, not through CSR programs. The authors argued that the concept of distributed leadership, with collaboration and accountability as its subsets, is what had the greatest impact on student achievement. The authors also hypothesized that when teachers were active in the governing processes of school and curriculum implementation, student achievement raised more than in CSR programs, thus supporting the idea that teacher quality dictates student learning, not class size.

CHAPTER 3

ANALYSIS OF CLASS-SIZE REDUCTION PROGRAMS

Class-size reduction programs are multifaceted. The programs implemented in school districts across the nation may be designed to fit the needs of the individual district or building. School districts, as part of the reauthorization in 2001 of the ESEA of 1965, received class-size reduction allocations in Title II, Part A funding. In so doing, the Department of Education gave districts permission to apply CSR monies in areas where they saw the greatest need, including: (a) hiring additional staff to reduce student-teacher ratios, (b) adopting curriculum that had proven results, and (c) updating facilities to better accommodate the population of students (U.S. Department of Education, 2004).

In order for districts to make informed decisions on how to use CSR allocations, school districts need to understand the components of CSR programs. The first area school districts need to address is average- versus actual-class size. The second area district personnel need to be aware of is student-teacher ratios. Lastly, school districts need to identify per-pupil expenditures, and how those expenditures increase student learning. Understanding these areas of CSR programs will lead to more informed decision-making in terms of CSR program implementation.

Average Class Sizes in the United States

Historically, schools in the United States were small, comprised of one room, and housed all students grades K-12. In 1940, Noll (2007) discussed how some 114,000 one-room schoolhouses provided a small-town atmosphere in which students received the individualized educational experiences that supported school success. By 1980, forty years later, almost no one-room schoolhouses existed because of school consolidation. Further,

school districts numbered 50,000 in the 1950s, and were reduced to 16,000 as early as the 1980s. The trend shown from the 1940s to the 1980s illustrated how schools and school districts believed that consolidation was the answer for all learners. School officials stated that students would learn best if they were provided with greater opportunities, which larger schools and districts could easily afford. The findings, however, revealed that the individualized instruction students once received in smaller classes and districts ceased to exist, and students were then grouped in larger numbers and in larger class sizes (Noll, 2007). Since the 1980s, school officials have received a backlash against their beliefs that *bigger is better* (Noll, 2007). These school officials believed that schools should return to the small-town milieu by which they were once characterized. Returning to those times was seen as near impossible, but proponents believed that they could reach a consensus by reducing class sizes in schools today that resembled the one-room schoolhouses that once populated our nation (Noll, 2007).

Schools in the United States do not limit their student-teacher ratio in classrooms at specified numbers. Instead, districts apply equations that use numbers of classrooms, fulltime educators (FTE), and students as divisors and dividends when discussing a district's average class size, allowing class sizes to grow based on a district's ability to have teachers and space available (U.S. Department of Education Institute of Education Sciences, 2009). Those who supported class size reduction (CSR), however, advocated for class sizes to be capped at varying numbers based on the age of students. Those who advocated for smaller class sizes did so for reasons such as opportunities for immediate reinforcement, early diagnosis and remediation of learning difficulties, and the ability to create lasting relationships with teachers and students with common interests (Achilles, 2003). Also on the list of positive

outcomes of small class size were student achievement in the areas of academics, behavior and discipline, citizenship and participation in and outside of school, and the development into competent and productive citizens (Achilles, 2003).

Schools today have a heavy burden placed upon them in regard to creating competent and productive citizens. The primary focus of schools in yesteryears was to create citizens. This focus is still important today, but students are coming to school unprepared to learn, for they are disadvantaged in many areas, and are lacking in social skills that were considered an expected outcome long ago (Howes & Pianta, 2008). As a result, schools need to change their modes of learning and teaching, and create the best possible environments in which to learn. Proponents of class size reduction believe that in order to provide the optimum learning environments, school districts need to cap the number of students in classrooms at each grade level, which will result in lifelong learners who will become competent citizens.

Student-Teacher Ratios per Grade Level

Not only did administrators and teachers disagree about what was appropriate in regard to student-teacher ratios at each grade level, but they shared disjointed viewpoints of what numbers were best when teaching students who were in different age groups. The National Association for the Education of Young Children (NAEYC) recommended, for national accreditation purposes, that student-teacher ratios be maintained throughout the program for greater consistency in student learning. In this respect, NAEYC has provided a chart which lists specific ratios for student-teacher classrooms for optimum teaching and learning for children from birth to kindergarten age. Also, NAEYC has stated that individual states and districts need to set student-teacher ratios for grades K-12 based upon their initial study results. For kindergarten students, however, the ratio was listed by NAEYC as 10:1 to

12:1. Those ratios were to be lowered when one or more children in the group needed additional adult assistance to fully participate in the program based on ability, language fluency, developmental age or stage. Although individual schools and districts currently do not seek NAEYC accreditation for school-age children, identifying that NAEYC addresses the youngest of learners in a district's educational offerings, allowed educators, administrators, and parents to see how low the ratio was set. This identification spoke to the average class size in many states, which was as high as 22:1, not 10 or 12 to one as outlined by NAEYC (U.S. Department of Education Institute of Educational Sciences, 2009). This misalignment from individual states and districts with the NAEYC indicated best practice is not considered when setting class sizes within the K-12 learning environment.

Per-Pupil Expenditures

The allocation of monies to students from state to state varies greatly (Jones & Gilman, 1993). In addition, the belief about what constitutes appropriate funding varies also. Many educators want to see an increase of funds so that districts receive financial support to meet their academic needs for their students. Educators also want to see the monies spent on programs and classroom supplies that will enhance existing curricula, but the majority of monies allocated per pupil within districts go for fuel costs, building upkeep, and advances in technologies (Jones & Gilman, 1993). As important as these areas are, educators understand the ranking order of such expenditures, but they also recognize the need to increase classroom spending, in order to increase student achievement. Januszka and Dixon-Krauss (2008) maintained that while educators, often proponents of CSR programs, supported greater increased spending on classroom items, policymakers and administrative teams,

frequently opponents of CSR programs, saw the reality of spending procedures, unlike supporters of CSR programs.

Januszka and Dixon-Krauss (2008) stated that two different studies were conducted to address school needs. The first study was a cost-benefit analysis, which focused on the administrative side of a district, the finance and leadership roles. Questions were asked by teams prior to adopting new programs such as: (a) how effective is this new program, (b) how will it increase student achievement, and (c) what is the ultimate cost of implementing a program such as this? The second study referred to curricular issues, focusing on pedagogy and student achievement known as the experimental analysis, and came from teachers, the ones working with children each day. While each group had the common goal of student achievement, they had a differed view on how to reach that goal.

Student achievement is the primary reason for implementing class-size reduction programs. Although proponents and opponents of CSR programs have differing views on appropriate ways to increase student achievement, much can be said about understanding the components of CSR programs. Average- versus actual-class size, student-teacher ratios, and per-pupil expenditures play an integral part in implementing any CSR program.

CHAPTER 4

GUIDELINES FOR IMPLEMENTING CLASS-SIZE REDUCTION PROGRAMS AND PRACTICES IN EARLY CHILDHOOD CLASSROOMS

In 2001, the United States Congress passed the reauthorization of the *Elementary and Secondary Education Act* of 1965, now titled *No Child Left Behind.* Special funds were appropriated for NCLB in order to give schools the advantage of reducing class sizes as a means of utilizing Title II, Part A allowances. Previous studies in Indiana, Tennessee, California, and Wisconsin led to conclusions that students in smaller classes achieved at greater rates compared to peers who attended class sizes in the lower to mid-twenties (Finn et al., 2001). Teachers and parents believe that reduced class sizes increase student achievement. The following guidelines are needed so that class-size reduction programs will be implemented effectively.

1. Average-class size versus actual-class size must be understood and communicated to all stakeholders.

In an effort to effectively communicate with stakeholders in the community, districts must disseminate information related to class size within its buildings. Sharp, (2003) referring to his research design which applied both qualitative and quantitative measures, maintained that districts use the terms average- and actual-class size interchangeably, which is incorrect. Districts use an equation to figure the average class size within its buildings. They also use the formula of *total students* divided by *fulltime educators*, and arrive at the *average student-teacher ratio*. What districts don't explain in great detail, however, is when entering *fulltime educator* numbers, special education, resource, Title I, specialty area teachers, and guidance counselors are considered *fulltime educators*, even though they have

no students assigned to them. What this creates is a sense of security in the fact that an elementary building has a student-teacher ratio of 17:1, when in fact the ratio has a standard deviation of +10, meaning a class could have as many as 27 students to one teacher (Sharp, 2003).

2. The components of class-size reduction programs must be understood and accepted.

Class-size reduction programs are comprised of various methodologies that individual districts implement based on specific need (U.S. Department of Education, 2004). Districts that receive CSR dollars are given flexibility in how they can spend the allocated monies. Some districts choose to hire additional teachers to reduce class size, while other districts opt for co-teaching classrooms due to a lack of physical space. Yet another option for districts is to hire additional Title I teachers or special education/resource teachers.

Another area to consider within CSR programs is where the funds are housed. Federal CSR dollars are housed in Title II, Part A funding, and were folded into that categorical funding with the reauthorization of the 2001 Elementary and Secondary Education Act of 1965. The U.S. Department of Education no longer acknowledges the Federal Class-Size Reduction Program as a functioning program, but allows districts to spend monies from Title II, Part A for program components as a viable means of increasing student achievement (U.S. Department of Education, 2004).

3. The research concerning regulatory elements of class-size reduction programs must be evaluated and used to improve student achievement.

Regulatory elements of CSR programs include appropriations of monies and percentage of monies used for each of the following areas: (a) recruiting, (b) training new teachers, (c) salaries, (d) local administration, and (e) professional development (U.S.

Department of Education, 2004). Each of the five outlined areas has percentages assigned to it, as mandated by the NCLB Act of 2001. Recruiting, training, and salaries are considered one area wherein districts are mandated to spend a minimum of 82% of CSR monies. Local administration was limited to no more than 3% of total allocations, while professional development was limited to the remaining 15%.

In the CSR Program's second fiscal year, the funds allocated for recruiting, training, and salaries decreased from 82% to 72%, while the funds allocated for professional development increased from 15% to 25%, allowing districts to engage a greater number of staff in professional development with those teachers hired to reduce class sizes (U.S. Department of Education, 2004). Reducing student-teacher ratio was a secondary goal of this program, raising student achievement, primarily in reading, was primary.

4. The public must invest more resources in class-size reduction programs.

In 1996 and again in 2002, two states legislated to limit student-teacher ratios (California Department of Education, 2009 and Florida Department of Education, 2009). California enacted a K-3 CSR program to increase student achievement in reading and math, while Florida enacted a K-12 CSR program to increase student achievement in each of the core-curricula areas of reading, math, science, and social studies.

California set the stage for the Federal Class-Size Reduction Program first authorized as P.L. 105-277. The federal government recognized California's initial steps in class size reduction efforts, as well as Tennessee's Project STAR, both of which served as the foundation for the Federal CSR Program. Florida is the newest state to mandate student-teacher ratios, having done so with legislation in the 2002 session, with full implementation in academic year 2010-2011 (Florida Department of Education, 2009).

Individual states must recognize the efforts in California and Florida. In so doing, states can implement similar programs that suit their educational and citizenry needs. The states were given powers over education, and therefore, it is imperative that individual states begin to look at student achievement, and with that, student-teacher ratios.

5. Districts must evaluate physical space when determining appropriate class size ratios within its buildings.

Schools that received CSR monies noted a handicap when it came to physical space within their walls. Although federal allocations had allowed individual districts to hire and train new teachers, what it didn't allow was updates to infrastructure (U.S. Department of Education, 2004). Instead, schools converted open space and smaller rooms into reduced-size classrooms. Other schools mentioned having hired teachers to team- or co-teach in larger classrooms because of a lack of extra physical space.

In newer schools, or in newer additions to schools, walls are partitions, and therefore are easily removed to increase physical space for larger classrooms when districts opt for co-teaching or teacher-aides as a means of implementing class-size reduction (U.S. Department of Education, 2004). The schools that implement CSR programs through co-teaching or teacher-aides do so out of physical space limitations.

6. Teachers should volunteer to be involved in class-size reduction programs, and have clear visions of what demands will be made upon them.

Class-size reduction programs have many characteristics, both liked and disliked by opposing groups. Schools that implement CSR programs must be dedicated to carrying out mandates of the program. Such mandates might include: (a) restructuring staff and classrooms, (b) implementing new scientifically-based curricula, (c) altering teaching style to

better differentiate for various learning styles, (d) cooperating with co-teachers and/or teacher-aides, and (e) attending professional development that targets small-group teaching strategies (U.S. Department of Education, 2004).

7. Districts must evaluate expenditures per classroom, per teacher, per student when receiving CSR dollars to insure that best practice and cost-effectiveness are being implemented.

Class-size reduction dollars differ from district to district. Need for CSR dollars is dependent upon a district's poverty data such as percent of families qualifying for free and reduced lunches, in addition to enrollment data (U.S. Department of Education, 2004). Districts receiving CSR dollars must indicate in their Certified Annual Report (CAR) where and how the monies were applied. With the Federal Class-Size Reduction Program folding into Title II, it is somewhat more difficult to track expenditures. Therefore, it is imperative that districts keep an itemized list of expenditures related to CSR monies, as well as legislators and state auditors revisit district's CAR at each fiscal year's end.

8. Policymakers must include education specialists, developmental theorists, and genetic epistemologists in legislative action concerning school policies, especially when setting student-teacher ratios per grade level.

NAEYC recommends class sizes be kept small for children ages birth through kindergarten as a means of insuring all children receive developmentally appropriate practices that include all areas of development: (a) cognitive, (b) physical, (c) social, and (d) emotional. Educational specialists and developmental theorists agree that children need time to grow and be nurtured; one way to secure that time and nurturing is by limiting numbers of children in classrooms today.

Genetic epistemologist, Jean Piaget, laid the foundation for applied practices today in the field of education. Piaget believed that children develop through four developmental processes known as Sensorimotor, Preoperational, Concrete Operational, and Formal Operational (Seifert & Hoffnung, 2000). These stages of development spanned from birth to adulthood. Piaget's theory of child development shaped educators' views on appropriate student-teacher ratios. Students in the Preoperational stage of development, ages 2-7, are ones that NAEYC recommend should be in class sizes of 6:1 to 12:1. Furthermore, students in the Concrete Operational stage of development, ages 7-11, need often and varied problem-solving activities and experiences that small class sizes offer. Although NAEYC's recommendations for class sizes end with kindergarten-aged students, several early childhood experts around the nation agree that class sizes for primary grade students should remain small, ranging in numbers from 12-18 students per class.

9. Districts must address both short- and long-term goals when implementing CSR programs.

Proponents of CSR programs suggested that lowered student-teacher ratios increased student achievement due to reduced time spent on behavior issues, increased time spent on individual needs, as well as an overall ability of teachers to identify struggling students who needed additional, sometimes specialized, support (Achilles et al., 2003; Ehrenberg, 2001; Handley, 2002). Proponents also discussed the health and well-being of participants in CSR programs, and how small class sizes led to higher graduation rates, college entrances, and college graduations. As a result, participants in CSR programs experienced higher wage earnings as well as improved health (Muennig & Woolf, 2007/8). Cuseo (2007) reported in his meta-analysis of CSR programs that student achievement was directly related to small

class size. Gilman (1988), Gilman and Kiger (2003), and Jones and Gilman (1993) found, however, that increased student achievement may be short-term, and therefore statistically insignificant in terms of long-term benefits. The same authors noted that student achievement rose from year one to year two of program participation, but decreased up to 50% in long term studies where students were tested in grade 4, having completed the four-year CSR program. Instead, opponents of CSR programs hypothesized that student achievement is not related to small class size; rather it is related to teacher efficacy. Opponents argued that teachers make the biggest difference in the classroom, in tandem with scientifically-based curriculum. When *quality* teachers are coupled with research-based curriculum student learning is heightened.

10. School districts need to look closely at the achievement of their students from elementary to secondary to see if there are conflicts in comparing the CSR program participants and their peers in larger group settings.

In an effort to understand CSR programs to a greater extent, research related to CSR program implementation should be looked at more closely. Researchers may need to focus on student achievement while in CSR programs in comparison to the achievement upon exiting CSR programs. One way researchers may identify discrepancies among the literature may be to administer diagnostic testing at each grade level to pinpoint the time at which the benefits of CSR programs in K-3 begin to decline. In so doing, more literature would be available for districts that may be considering implementing CSR programs.

CHAPTER 5

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The purpose of this study was to examine the effects of class-size reduction programs in relation to student achievement and to present guidelines for implementing best practice in K-3 classrooms related to student achievement and class size. To accomplish this purpose, this paper addressed the following questions:

1. What are the benefits of class-size reduction programs?

Class-size reduction programs have endearing qualities that appeal to individual states and districts that make them worthwhile programs to implement. Districts that implement CSR programs see positive changes in academics, behavior/discipline, citizenship, participation, relationships, and in overall development and self concept growth (Achilles, Finn, & Pate-Bain, 2001). Achilles, Finn, and Pate-Bain (2001) speak of short-term benefits of CSR programs. In contrast, long-term benefits of CSR programs include overall health and well-being of student participants, as well as teachers within the classrooms (Muennig & Woolf, 2007/8). The increase in physical health and well-being was seen to be of greater proportion to those students who qualified for free and reduced lunch programs more than middle- and high-income students. The statistics on health and well-being for program participants is directly related to student achievement while in CSR programs in grades K-3 (Achilles et al., 2003). Students in CSR programs showed marked improvement in comparison to their peers at each grade level: (a) K-3, (b) 4, (c) 8, (d) 12, and (e) post-secondary, which led researchers Achilles et al. (2003) to the conclusion that health and well-being began in the earliest years of CSR program implementation, and the number of years

spent in CSR programs were important mediators in determining the amount of benefits gained.

Although the benefits of CSR programs in terms of overall health and well-being are important, critics ask that more attention be paid to the notion that students are making gains in their adequate yearly progress, and that standardized test scores are increasing. Researchers Gilman (1988), Gilman and Kiger (2003), and Jones and Gilman (1993) suggested that student achievement raised from year one to year two while participating in CSR programs, but then dropped as much as 50% upon diagnostic testing after having completed the four-year CSR program in grades K-3. Reviewing these researchers' findings leads critics to believe that while CSR program implementation in grades K-3 seems to have positive effects, the long-term benefits are questionable and doubted by notable researchers in the field. As Achilles et al. (2003) and others stated students showed improvements compared to their peers through the twelfth grade. Further observation at the middle and secondary levels needs to be revisited in order to determine where difficulties are occurring and what those difficulties may be.

2. What are the weaknesses associated with class-size reduction programs?

Class-size reduction programs have negative characteristics that keep some states and districts at bay. The cost-effectiveness of implementing CSR programs is astronomical, and not feasible for several districts. When CSR programs are implemented, districts must hire new teachers, reduce student-teacher ratios, and update infrastructure, all with limited funds (U.S. Department of Education, 2004). Some districts believe hiring new teachers to reduce student-teacher ratios is not the solution to raising student achievement in schools today. Rather, the curricula are what drive student achievement, paired with *quality* teachers, not

smaller class sizes (Wilde, 2004). *Quality* teachers take into account individual student's learning styles, and then alter their teaching style to accommodate and differentiate for each student. This practice, noted by Graue et al. (2007) and Gilman (1988), was what increased student achievement more than smaller class sizes. Continuing on the notion that *quality* teachers have greater impact on student achievement, schools that implemented CSR programs began hiring teachers with conditional licenses or teachers who filled positions but were not certified or endorsed in the areas in which they were teaching. This situation created a disadvantageous environment for already struggling students, most often in inner-city and rural schools (U.S. Department of Education, 2004).

3. What are the guidelines for implementing best practice in K-3 classrooms related to student achievement and class size?

This review of the literature determined that citizens need to be better informed of class-size reduction programs and their characteristics in order to make informed decisions about what is best for increased student achievement.

1. Average-class size versus actual-class size must be understood and communicated to all stakeholders.

Districts figure their average class sizes based on student enrollment and fulltime educators. In so doing, it communicates to community members that class sizes are lower than they actually are because special education, resource, Title, specialty area teachers, and guidance counselors are considered FTEs, and therefore offset the average- and actual-class size.

2. The components of class-size reduction programs must be understood and accepted.

Taxpaying citizens must understand that CSR programs may be composed of a variety of methodologies and strategies. Not all CSR programs that are implemented must hire additional teachers. Districts receiving CSR monies may opt to hire new teachers for new classrooms, hire new teachers to co-teach in existing classrooms, or hire teacher-aides who work closely with classroom teachers to instruct students on a daily basis. Taxpayers also need to be aware that districts may receive CSR monies, yet spend them on curricular materials that increase student achievement, rather than hiring additional teachers.

3. The research concerning regulatory elements of class-size reduction programs must be evaluated and used to improve student achievement.

The regulatory elements of CSR programs include: (a) recruiting new teachers, (b) training new teachers, (c) salaries for all teachers within the CSR program, (d) administration, and (e) professional development for all teachers within the CSR program. If all five areas are regulated within a CSR program, student achievement will increase, provided *quality* teachers are comprised within the program's grade levels.

4. The public must invest more resources in class-size reduction programs.

Individual states have the power to set student-teacher ratios. In 1996, California set the stage for the Federal Class-Size Reduction Program which was implemented in 1999, as a means of increasing student achievement in reading in grades K-3. In 2002, Florida amended its state constitution to set student-teacher ratios in K-12, in order to raise student achievement in all core-curricula courses.

5. Districts must evaluate physical space when determining appropriate class size ratios within its buildings.

Class-size reduction monies are earmarked for specific regulatory components within the program. An area that is sadly overlooked is physical space. The monies within the CSR programs don't allow schools and districts to update infrastructure, leaving districts to apply creative thinking to their space quandaries. Some districts have utilized open space such as gymnasiums or commons to serve as makeshift classrooms, as well as have turned existing rooms such as lounges and workrooms into smaller classrooms to accommodate the CSR program requirements (U.S. Department of Education, 2004).

6. Teachers should volunteer to be involved in class-size reduction programs, and have a clear vision of what demands will be made upon them.

Class-size reduction programs are intense. These programs require teachers to change past practice in order to raise student achievement. The methods associated with CSR programs to bring about change include: (a) adopting new scientifically-based curricula, (b) sharing responsibilities such as co-teaching and/or working with teacher-aides, (c) moving of classrooms, and (d) changing theory and practice to accommodate differentiated instruction within the classroom in order to reach diverse learners (U.S. Department of Education, 2004).

7. Districts must evaluate expenditures per classroom, per teacher, per student when receiving CSR dollars to insure that best practice and cost-effectiveness are being implemented.

Class-size reduction monies now come to districts as part of Title II, Part A funds, in partnership with other programs such as Teacher Quality. These funds are appropriated to individual districts based on need. It is therefore imperative that districts keep itemized lists of expenditures related to Title II, Part A monies to communicate to state departments of

education that monies are still needed and are being used effectively. Each year districts submit to the state departments of education a Certified Annual Report (CAR) that clearly lists all expenditures for the fiscal year within the district. The state departments of education can then audit the CAR to insure monies allocated were spent correctly.

8. Policymakers must include education specialists, developmental theorists, and genetic epistemologists in legislative action concerning school policies, especially when setting student-teacher ratios per grade level.

Education specialists and developmental theorists need to be included in policymaking regarding education issues, especially when debating the issue of class size. Early childhood teachers and experts are trained in developmentally appropriate practice, and can therefore provide sound educational guidelines to policymakers to insure best practice is being implemented in all early childhood classrooms, grades preschool through third.

9. Districts must address both short- and long-term goals when implementing CSR programs.

CSR programs have both short- and long-term benefits. Short-term benefits include increased student achievement, increased control of classroom behaviors, and a greater sense of community among its participants (Achilles et al. 2003). Long-term benefits include health and well-being of program participants (Muennig & Woolf, 2007/8). As a means of ensuring student success in CSR programs, opponents call for research-based curriculum implementation and collaboration among teacher teams to withstand new accountability measures imposed by *No Child Left Behind.*

10. School districts need to look closely at the achievement of their students from elementary to secondary to see if there are conflicts in comparing the CSR program participants and their peers in larger group settings.

Contradictory statements from researchers suggest CSR programs are either effective or ineffective. More research needs to be conducted in terms of diagnostic testing of students in order to gauge student achievement at each grade interval: (a) elementary, (b) middle, and (c) secondary to see if discrepancies within school districts exist. Upon administering these diagnostic tests, school districts may see grade levels in which the benefits of CSR programs begin to decline, allowing district administrators and teachers to be proactive in their continued CSR program implementation.

Conclusions

The following conclusions were determined from this review of literature:

1. Statewide and/or nationwide student-teacher ratios and quality teaching need to be set to insure high levels of student achievement.
2. Districts need to have increased funding to support CSR efforts.
3. Student achievement is top priority for all schools nationwide, and therefore need professional development centered to improve student learning.
4. Infrastructure of schools nationwide needs addressed to accommodate diverse learners.
5. Citizens need to be informed of CSR programs and its tenets.

Recommendations

Based on the review of the literature, the following recommendations are suggested:

1. State and National departments of education need to set student-teacher ratios for all grades PK-12. The following guidelines are taken from Florida's CSR program: (a) K-3, 12-18:1; (b) 4-8, 18-22:1; and (c) 9-12, 22-25:1(Florida Department of Education, www.fldoe.org/classsize/).
2. Schools need to work within the confines of the *No Child Left Behind* Act of 2001 in relation to CSR programs to bring forth equitable teaching and learning for all students.
3. Districts need to address current methodologies and pedagogies in terms of student achievement. In so doing, districts may need to mandate teachers to implement different practices that are research-based with both short- and long-term goals that prove increased student achievement (Gilman & Kiger, 2003; Graue et al., 2007; Johnson, 2002; Wilde, 2004). These research-based practices may include teacher *modeling* for increased student learning, *scaffolding* to meet students' individual needs, *encouraging* students to help one another, and the implementation of *developmentally appropriate practice (DAP)* principles as recognized by NAEYC. Each of these different practices are viable, research-based methods of reaching each learner. These practices are more easily implemented in small groups, allowing the teacher to be more readily available to work with individual students.
4. State and National departments of education need to commit to higher levels of student achievement by implementing a program that is attainable and feasible to

increase student performance that will place the United States of America among the highest achievers worldwide.

5. State departments of education need to implement research-based curricula in school districts nationwide in order to produce competent, lifelong learners.
6. Districts put in place advisory committees with certified and experienced personnel in each respective field to insure best practice is being implemented, and that there is rigor and relevance to the existing curricula. Mandating this type of committee within districts will improve the success rates of teachers with long term goals.

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