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ABSTRACT

This manual draws together evolving information about how group size influences what the group does and how learning tasks may be designed and employed to accomplish desired outcomes. The manual includes ideas from research on class size and its outcomes; theories of learning and development; and validated experiences of expert educators. It provides information and tips for class-size advocates to use in working at the early elementary level. Following an introduction and executive summary, the second section of the manual offers tips, hints, and strategies for getting involved politically to support candidates who advocate for small classes. The next section summarizes what research says about best ways to implement appropriate-size classes in grades K-3, stressing that small classes are not an extension of project-driven pupil-teacher-ratio efforts. The next section provides a sample evaluation outline for assessing class-size change. Included is a list of references used in the manual and selected sources of class-size information in a bibliography. Appended are a comparison of class size and pupil-teacher ratio, a class-size fact sheet, and a listing of research-supported theories to support small classes. The manual will be revised periodically as new information becomes available. (WFA)

REASONABLE-SIZE CLASSES FOR THE IMPORTANT WORK OF EDUCATION IN EARLY ELEMENTARY YEARS.*

A MANUAL FOR CLASS-SIZE REDUCTIONS SO ALL CHILDREN HAVE SMALL CLASSES AND QUALITY TEACHERS IN ELEMENTARY GRADES.**

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Presented at the American Educational Research Association
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* Principal compilers (alphabetically) are C. M. Achilles, Jeremy D. Finn, and Helen Pate-Bain. Material was originally presented (11/18/99) at the Mid-South Educational Research Association (MSERA) November 17-19, 1999, Point Clear, AL as part of the MSERA Symposium: What Does The Finding Of A Class-Size Effect Mean For Professors And Practitioners? The material includes ideas from political strategies, research outcomes, theory, and consensually validated exemplary practice.

** Many persons have contributed to this draft. We solicit additional ideas and proven practices. Contributors to date (alphabetically) besides those already listed include: J. Boyd-Zaharias, P. Egelson, B. D. Fulton, S. Gerber, P. Harman, G. Pannozzo, and other researchers who provided a basis for the Manual. Many of their works appear in the references/bibliography, Part V. Some findings from the STAR database and related studies have resulted from continuing analyses supported by a Spencer Foundation grant: "A Study of Class Size and At-Risk Students."

Part I. Introduction and Executive Summary

This Manual draws together evolving information about how group size influences what the group does and how learning tasks may be designed and employed to accomplish desired outcomes. The Manual has six parts. People interested in improving schooling based upon years of research, theory development; and observations and anecdotes of master teachers, parents, and students will find important resources here.

Summary Contents

Executive Summary

There is a modest Federal class-size initiative, but the real fight for appropriate-size classes for young students, grades K-3, that help students learn and teachers teach their best will be at the state and local levels. This Manual includes ideas derived from three sources: Years of substantive research on class size and its outcomes, theories of learning and development, and validated experiences of expert educators. It provides information and helpful hints for class-size advocates to use in working at the grass-roots level to help young students (who do not vote) get a fair break in the early years of their 13- plus year odyssey of public education.

Part II includes tips, hints, and strategies to get involved politically to support candidates who believe that young children deserve reasonable class sizes. These strategies were formulated primarily by Helen Pate-Bain, EdD, who has been politically and professionally active for young children. As President of the National Education Association, as a professor and a STAR (Student Teacher Achievement Ratio) researcher, and as an education advocate, she has lobbied effectively for attention to young students and improved conditions for teachers. Her "down-home" approaches work. Try them.

Part III summarizes what the research says about best ways to implement appropriate-size classes in elementary grades (K-3). Small classes are not an extension of project-driven Pupil-Teacher Ratio (PTR) efforts currently popular in schools. (See Appendix A). Class-size reduction is NOT just hiring teachers and continuing "business as usual." Small classes are most effective when the student starts school in them and has 3-4 (or more) years of the small-class "treatment." Start the implementation in grades K-1, and add a grade per year until full implementation. This phased approach provides time to seek personnel and space, to plan, and to evaluate outcomes.

Part IV. To sustain the class-size effort, to improve it, and to increase professional knowledge of the "small-class" effect, evaluation of class-size processes and outcomes and continuing research are required. Evaluation should be conducted using the best methods and design available and appropriate to study short-term and long-tern results. Report problems encountered and the strategies that you (or your school or district) tried to resolve problems. Provide evaluation data on important education outcomes other than just academics (test scores), including behavior, citizenship, and development.

Part V includes references used in the Manual and selected sources of class-size information in a bibliography. The material is organized to show: A. Research Articles; B. Narratives and Professional Articles; C. Web Sites; D. Edited Sources, both books and journals; E. Research Reports; and F. Criticisms of Class Size.

Part VI is appendices, including a "Class-Size Fact Sheet" (Appendix B) that readers are encouraged to duplicate and share with policy makers and parents, and a listing of research-supported theories to support small classes (Appendix C).

This Manual will be revised periodically as new or improved information becomes available. For example, future work may include evaluation results from state-level initiatives, such as from California, Texas, and Wisconsin, or from British Columbia, and from other continents such as Australia.

PART II. HOW TO MAKE SMALL CLASSES A REALITY *

A century of research and common sense supports the idea that young children benefit in the short term and in the long run from appropriate-sized classes in the early years of schooling. There are many theories and research-supported reasons why early small classes help students succeed in school and in later life. For example, when hiring a new worker, a business usually provides some training about what is expected. Consider that when a child enters public school, educators want that "worker" to learn the business of schooling well and like it well enough to stay and be successful for 12-13 years. Presume that a 4 or 5 year old does not intuitively understand what schooling require! Appendix A contains a listing of reasons why and how small K-3 classes work for students and teachers.

The positive benefits of appropriate class sizes are important enough to require adult attention. Done correctly, small classes in K-3 need not be expensive because they can be achieved primarily by reallocations of existing resources. The research evidence to support the "Why" and "How" of small classes for young children (grades K-3 or so) is readily available and resources are provided in Part V of this Manual.

I. ELECT CANDIDATES WHO BELIEVE IN AND WORK FOR APPROPRIATE CLASS SIZE.

A. Interview all candidates and be sure they understand the following points:

1. The difference between class size and pupil teacher ratio (PTR).

   Class size is the number of students who regularly appear in a teacher's classroom and for whom that teacher is primarily responsible and accountable. Pupil Teacher Ratio (PTR) is a derived estimate commonly computed by dividing the number of students in a school by the number of professionals who work at or serve that school (e.g., counselors, special teachers, administrators, librarians, etc.). These differences are about 10: In a school with a PTR of 16:1 you will find class sizes of about 26. (See detail in Appendix A).

2. Areas of concern where small classes do make a difference:

   a. Financing (small classes need not be expensive).

* Material is presented in outline form and is adapted from H. P. Bain's web site, Reduce Class Size Now. Available at: http://www.reduceclasssizenow.org./howto.htm. Helen Pate Bain - (251) 540-7012

- Fewer retainees in grade. Retainees cost double and take space
- Fewer dropouts (annual income of a dropout is $5200 less than the income of a high school graduate)
- Fewer discipline problems (less costly vandalism)
- Creative use of space (portables, churches, empty stores) Two compatible teachers and 30 students in one room may be a "last-ditch" alternative.

b. Enhanced student performance

- Increases student participation in classroom and school activities
- Increases student achievement on standardized tests
- Improves student behavior in school
- Narrows the black/white achievement gap
- More small-class students attend college

c. Teacher recruitment, retention, incentives

- Appropriate class size is a top priority for quality teachers.
- Appropriate-size classes are an incentive that attracts quality teachers
- Small classes help reduce teacher (and student) "burn out"
- Teacher and student affect (morale) improve.

B. Endorse and work for candidates who advocate small classes.

1. Donate money to help their campaigns
2. Help in campaign headquarters
3. Bring friends into your home to meet the candidate
4. Advertise the candidates who advocate small classes
   - Write letters to the editor
   - Put a sign in your yard
   - Seek endorsements from groups to which you belong (PTA, etc.)

- Put a bumper sticker on your car
- Encourage friends to do the same

II. STATE, FEDERAL, AND LOCAL-LEVEL PLANS OF ACTION

A. Establish state and local coalitions.

1. Identify and contact decision makers

- state and federal legislator
- local politicians and leaders
- state and local education board members.

2. Identify supporters

- parent groups, PTO, PTA, PTSO, etc.
- business leaders, chamber of commerce, civic clubs (such as Rotary, Kiwanis, etc.)
- education leaders: superintendent, elementary and secondary principals' groups, teacher associations
- media: press, radio, TV, newsletters, etc.

3. Contact organizations endorsing class size reduction, such as:

- American Federation of Teachers (www.aft.org)
- American Association of School Administrators (www.aasa.org)
- Council of Chief State School Officers (www.ccsso.org)
- Council of Great City Schools (www.cgcs.org)
- National Association of Elementary School Principals (www.naesp.org)
- National Association of State Boards of Education (www.nasbe.org)
- National Conference of State Legislators (www.ncsl.org)
- National Education Association (www.nea.org)
- National Parent Teacher Association (www.pta.org)
- Association of Supervision and Curriculum Development (www.ASCD.org)
- Phi Delta Kappa (www.pdk.org)

B. Establish a timeline and follow it.

C. Be persistent and follow up initial contacts.

III. HOW TO IMPLEMENT SMALL CLASSES (Part III of this manual contains detail on this topic).

A. What is an effective timeline?

Because research has shown that the small-class treatment is most beneficial if it begins when the youngster starts school and then lasts at least three years, the following timeline for class-size reductions is recommended for maximum outcomes with minimum confusion and costs.

- Year 1: Provide full day Kindergarten classes of one teacher and 15 students (1:15) with a maximum class size of 18 students.
- Year 2: Adjust classes in grades K and 1.
- Year 3: incorporate small classes in grades K,1,2.
- Year 4: Finally, have appropriate class sizes in grades K, 1, 2, 3.

B. How can necessary classroom space be provided?

- Have a committee of teachers and others determine the most effective use of existing building space.
- Use classroom space in nearby churches or other sites. Connect these classes to the "home base" via technology.
- Rent empty space in nearby buildings.
- Establish partnerships with nearby businesses that may donate space, especially if they are "downsizing" or providing on-site early-childhood education for employees' children..
- Establish a long-range building program.
- Hire an additional certified teacher for a grade level (e.g., provide three teachers for two-third grade classes and distribute students equally among the three teachers to teach reading and math).
- Convert to a year-round schedule, or other-time usage that facilitates small classes.
- Work with local developers to see if they will include "early childhood" rooms in clubhouses of new subdivisions for small K-1 classes. The school district pays the teachers.

C. What are some cost-saving factors of class-size reduction?

1. Retention rates decrease (the costs double every time a student fails, and retainees are potential dropouts).

2. Drop-out rates decrease (high school dropouts have an unemployment rate 4 times greater than do high school graduates).

3. Improvement of student behavior in school

- Classroom disruptions decrease, providing more time for teaching.
- Classroom management problems decrease.
- Vandalism costs decrease.
- There are fewer referrals for student misconduct
- Required corrective actions (e.g., Saturday school or detention) decrease.

4. Reduction of costly remediation and special projects

- Fewer expensive special projects will be required in later years.
- Fewer remedial projects will be needed.
- Funds and special projects can be targeted to youngsters who most need special help.

5. Early identification of learning problems (see also #4 above).

- Programs can be accurately "targeted" to most needy students soon enough to make a difference (e.g., like Reading Recovery).
- inclusion efforts become more effective.
- Special education programs are reduced in later years.

6. Improvement of teacher morale and job satisfaction:

- Increased attendance
- Reduced "burn out"
- Reduced substitute costs
- Teachers stay in teaching

7. Improvement of community, parent, and volunteer involvement:

- Small classes attract parents and volunteers and reduce costs of special, and often unsuccessful, parent-involvement projects.
- More field trips are possible. One teacher and two parent volunteers can safely take the small class on a field trip and monitor all students.

- Parents get involved to help their children learn at home and school.
- Teachers get to know parents well.

D. Whom do you need to keep informed about class-size reduction efforts?

- The profession (Local educators and education associations).
- Parents
- Policy makers
- Voters
- Media
- Citizens and business leaders

E. What information do you need to provide? Keep good records and data.

- Student data and characteristics [race, gender, ethnic groups, English as a Second Language (ESL) families, socio-economic status (SES) characteristics, etc.). This information will be useful in evaluation of the class-size initiative. (See below and Part III of Manual.)
- Obtain anecdotal information and "stories" from teachers.
- Keep testing outcome information (test scores).
- Collect school-level data (class size, services, accreditation, retentions, discipline, administration), etc.
- Compare new outcomes with prior performance of similar students in your school and system, and in nearby systems.
- Follow-up information, such as drop-out rates, discipline referrals, and curriculum choices in later grades.

IV. SET UP AN EVALUATION PLAN FOR YOUR CLASS-SIZE REDUCTION PROGRAM. (Added detail is in Part IV of this Manual).

A. Decide the questions you want to answer.

- Are test scores better this year than in the past?
- What is the impact of smaller classes on various groups of students (race, gender, SES, special education, ESL, advanced students)?
- What happens to the grade-retention rate in each grade?
- How is student behavior different (discipline, attendance)?
- How have teacher attendance, morale and/or perspective changed?
- Are teachers teaching differently? If so, how?
- What are the changes in parent involvement?

- Does the continuing staff development plan now include teaching in small classes?
- What are participation rates in the small classes?
- What are long-term results from class-size reduction?

B. Use recognized and reputable research and evaluation methods.

- Try to enlist help from persons who regularly do research and evaluation to guide your work. (Graduate students, University personnel, etc.).
- Determine if there are any differences between students and teachers participating in the evaluation and students and teachers who do not participate or have not participated in small classes in the past 3 years.
- Randomly assign students and teachers to classes.
- Use pre- and post-tests, or gain scores from year-to-year.
- Rely on tests usually given in the district rather than trying to establish a new testing program.
- Establish a student baseline using students' test scores from the previous year. This will allow "benchmarking" against such things as state and national norms and as a comparison (over time) with other schools in the same district (or similar schools in other districts).

C. Collect data that can answer your questions.

- Use the scores from existing (local and/or state) required tests. Avoid using additional tests. Use both standardized tests and specific objective-driven tests that may be required by your state or district.
- Document success stories from teachers, parents, and students.
- Document concerns and problems of parents, teachers, others.
- Document discipline referrals, attendance/tardiness, participation in school events.
- Document teacher attendance and health status.

PART III. HOW TO IMPLEMENT SMALL CLASSES IN ELEMENTARY GRADES CORRECTLY RO SHOW STUDENT BENEFITS

Introduction

As the move to implement appropriate-sized classes in America's public schools escalates, educators need to use the available research to guide the changes. From years of studying and observing small classes, researchers and scholar practitioners have developed a research base theories, and consensually validated exemplary practices of outstanding teachers to guide effective class-size implementations of small classes. Informed Professional Judgement or IPJ is at the heart of class-size changes. **SMALL CLASSES ARE NOT SIMPLY HIRING TEACHERS AND DOING BUSINESS AS USUAL.**

A true class-size initiative will incorporate what the long-term class-size research has determined are important steps for successful class-size initiatives. Some key elements for small-class initiatives are shown in Table III-1.

Table III-1. Important Considerations for Implementing Small Classes, K-3.

1. Early Intervention. Start when the pupil enters "schooling" in K or even pre-K.
2. Intense Treatment. The pupil spends all day, every day in the small class. Avoid Pupil-Teacher Ratio (PTR) events, such as "pull-out" projects or team teaching. Develop a sense of "community" and close student-teacher relations.
3. Sufficient Duration. Maintain the small class for at least 3, preferably 4, years for enduring effects.
4. Use Random Assignment in early grades to facilitate peer tutoring, problem-solving groups and student-to-student cooperation. (STAR).
5. Employ a Cohort Model for several years so students develop a sense of family or community. STAR results show the power of both random assignment and a cohort model. "Looping" adds teacher continuity to the cohort, and may be a useful strategy for added benefits.

Appropriate-sized classes in elementary grades will take policy perhaps and even legislation change. Therefore, a first task is to seek political "clout" for children's benefits. (See Part II of the Manual).

1. Work to elect candidates who believe in small classes in elementary grades. Work with local educators to plan and to implement the small-class effort in accordance with the best principles from the huge class-size research base and from best practices of quality teachers.

2. At the actual implementation stage, begin the small-class treatment as early as possible, in Pre-K or K if that is when public schooling starts. Young children need to learn what school is all about and how to do school work when they first start in formal schooling.

a. Consider random assignment of students and teachers. If random assignment is not an option, assure mixed-ability (heterogeneous) groups for K-3.

b. Consider keeping students together as a cohort (if feasible) for a couple years. Cohorts develop camaraderie and a sense of community that nurture young learners. Looping is also an option, as is a non-graded approach, or some combination of structures.

3. Move the small-class treatment ahead one grade per year until grade 3 (or grade 4, if possible). The phase-in process allows an orderly progression so educators can use experience to plan for space, personnel, and for contingencies that develop in each year. Moving ahead one grade level a year takes maximum advantage of what the experimental and quasi-experimental class-size research has shown: The small-class treatment is most beneficial when it begins when the youngster begins school, and then lasts at least three, or better, four years.

4. Obtain teacher, parent, administrator, student and other peoples' "narratives" to provide examples and "qualitative" elements of the class-size reduction (CSR). Collect and use "before/after" examples.

5. Use all of the research available to assure the best possible implementation model. This includes attending to the Teacher Aide issue (avoid using non-certified personnel in instructional roles). Do not pick and choose from the class-size research without valid reasons. Maintain the fidelity of the original research in any local implementation model.

6. Systematically keep records and data to substantiate the CSR approach that you have followed. Compile student data and characteristics (race, gender, SES, etc.), teacher data, building-level data (size, services, accreditation, retentions, discipline, administration), and student outcome data, such as test scores, discipline, attendance, and more.

7. Plan and conduct an evaluation of any and all small-class or CSR events that you are part of. Part IV of the Manual contains a sample evaluation plan that might be adapted for local-site use in evaluating CSR efforts.

8. Communicate with the profession, parents, media, and policy persons to share both the good and the less obvious elements of CSR. Clear and cogent communication will include material on context, processes, and outcomes of the CSR effect.

9. Consider and collect information on **both** costs and benefits. Research, theory, and informed professional judgement (IPJ) have demonstrated some areas of cost savings in using small classes. (See Table III-2). There may be other cost-benefit items that current studies have not yet determined.

TABLE III-2 ABOUT HERE

Table III-2. Checkpoints In Assessing True Costs of Reasonable-Sized (e.g. 18:1 or so) Classes in Primary Grades. (Modified from Achilles & Price, 1999).

Item	Potential for Cost Saving
A. Grade Retention	A. • Number of students held back decreases • Later drop-out rate decreases
B. Improved Student Behavior in School	B. • Vandalism costs decrease • Required corrective actions, such as Saturday school or detention decrease • Classroom disruptions decrease
C. Remediation and Special Projects	C. • Fewer expensive special projects required • Concentrate on fewer students intensely for shorter duration
D. Early ID of Learning Problems	D. • Special education programs reduced in later years • Programs accurately "targeted" to most needy students • Note possibility of increased costs in K and 1 • More effective use of inclusion
E. Teacher Morale	E. • Increased attendance • Reduced substitute costs • Reduced "Burn out"
F. Creative Space Use	F. • Transportation-related costs • Flexibility and "found" space • Partnerships with business
G. Community, Parent Involvement, Volunteers	G. • Small classes attract parents and volunteers • Field trips (etc.) are less congested • Teachers get to know parents well
H. Teacher Aides	H. • Research suggests reducing aides and assigning those remaining to non-class (support) work).

10. Although the research shows that positive changes occur just by reducing class sizes to manageable levels for teachers to be effective, continuous professional development is one hallmark of a profession. Professional development specifically geared to the CSR initiative may assist teachers to become proficient more quickly and smoothly in small classes than if the teachers are not provided this assistance. Some topics that may be useful are suggested here. Focus upon such things as:

a. Appropriate uses of teacher assistants in the classroom, or strategies for cooperative work by adults in the education process. This may include parents and other volunteers. The research about teacher aides in classrooms is consistent in suggesting that they generally are NOT a positive influence on student learning or behavior as now used.

b. Information and ideas for teachers who will receive the young students after they leave the CSR classrooms. (This may be the first time that these teachers get students who are mostly on grade level, highly interactive and participative, and individually engaged in their own learning.) The receiving teacher may see on-task behavior as disruptive, students demanding attention, etc. The small-class youngsters have been used to individual attention, active participation, and their own involvement in their learning. Small-class students will be active!

c. Work carefully with teachers who do not have small classes. They need to understand the small-class benefits for themselves: students on grade level who behave well and participate in their own education. They need to understand the differences between the "before-and-after" small-class students.

d. Strategies that have worked in small classes, as noted by perceptive teachers who have maintained records and narratives of demonstrated successes in small classes.

e. Expectations about student academics and behavior that administrators have developed from their reading and understanding of the research: academic gains, referrals for special education screening, student behavior and participation, reductions in retention and in discipline problems, increased parent involvement.

11. Although academic gains—usually narrowly defined as test outcomes in reading and math—are important to politicians and policy persons, be sure to stress and assess other demonstrated benefits of CSR: Participation, behavior and discipline, safety, reduced dropout, increased scores on all tests taken (not just reading and math), and student choice of more difficult curricula in later school grades. Report all of the benefits, not just the reading and math scores. Table III-3 shows the ABCD's of small-class outcomes.

Table III-3. School Improvement Means Improving the Outcomes Of Schooling—To Make Schools Better for the Students. A Good Class-Size Initiative Will Show How Students "Perform"/Achieve In Four Key Areas of Growth.

THE ABCD'S OF IMPROVEMENT. THESE OUTCOMES WILL INCLUDE POSITIVE CHANGES IN:

ACADEMICS (E.G., TEST-SCORE PERFORMANCE ON ALL TESTS.)

BEHAVIOR/DISCIPLINE. ADJUSTMENT TO SCHOOL

CITIZENSHIP/PARTICIPATION, RELATIONSHIPS

DEVELOPMENT [DEVELOP INTO PRODUCTIVE AND HUMANE ADULTS, WITH RESPONSIBILITY FOR ACTS.] AND SELF CONCEPT GROWTH.

12. Explain that standardized-first-year test results in CSR may be lower than the media clamored for at the outset of CSR, and also lower the 3-4 year results obtained at the end of experimental studies and large CSR projects. Major test-score gains from CSR occur after the student spends 3-4 years in a small class, or usually 3-4 years after the CSR effort begins. There should be some modest gains after only one year (the inoculation); but the student needs a small-class diet for several years before there are large and lasting benefits. Collect results of criterion-referenced tests (CRTs), not just results of standardized, or norm-referenced tests (NRTs), because CRTs are sensitive to what is taught.

13. Be precise in using the terms class size and Pupil-Teacher Ratio (PTR). The terms are not the same, nor are the results of using them. Appendix A includes a discussion of key points in the class-size and PTR debate. A compelling evaluation might show separate results for class size and PTR efforts.

14. Professors should study the class-size research (1909-now) and incorporate the results in their classes on school improvement. It is no longer adequate for Professor X to claim that class-size doesn't matter and to seek to teach only small on-campus seminars!

PART IV. SAMPLE EVALUATION OUTLINE TO GUIDE ASSESSING CLASS-SIZE CHANGE

I. Introduction.

Often a professional needs to choose between alternatives, such as to recommend program A or program B. A recommendation should be based on data, as well as on theory, and exemplary practice. One way to obtain data for decisions is through an evaluation of program A and of program B using stated criteria (putting a value upon one or the other). For example, in 1998 Michigan set aside $17 million for pilot tests of small (1:15 – 1:20) classes, K-3. Each district that received pilot-test money for class-size reduction [CSR] had to include an "Evaluation Plan or Outline" in the proposal for funding. Results of solid evaluations should provide decision data.

One approach to start an evaluation might be for the district to call together a committee that includes teachers, administrators, some parents, and university research and/or evaluation personnel to "brainstorm" ideas before developing the final plan. A committee's initial planning meeting in a district proposing CSR or small classes might address the following.

II. Notes and Suggestion: Evaluation Plan for CSR, Grades K-3.

A. Use the present testing. This avoids the idea of "special" testing and does not add more testing to the agenda.

B. Build a database that will serve as a starting point for "Benchmarking" against such things as state or national norms, and as a comparison (over time) with other schools (in the district, or similar schools, etc.)

C. Determine questions to answer. These could be from results of prior studies, from local or state objectives, from needs, from state guidelines, etc. Questions for analysis might emphasize the following areas of interest:

1. Special education (Sp. Ed.) referrals and outcomes
2. Retention-in-grade changes
3. Parent involvement
4. Teacher behavior
   a. In classes of different sizes
   b. Morale/Satisfaction
   c. Absences
5. Teacher perceptions of teaching and learning
6. Impact on various groups [race, gender, at-risk, socio-economic status (SES). ESL, groups, etc.]
7. Staff development efforts
8. Space use
9. Teacher recruitment

10. Personnel re-allocation steps
11. Other

D. Provide detail about the context and processes used to obtain the appropriate class sizes in K-3. Include some explanation of problems, steps to resolve problems, unanticipated events, etc.

E. Determine if experiences at your site replicate findings of earlier studies, such as:
   1. Small-class intervention is greatest in the early years (prevent vs. remediate).
   2. If implementation was K-3 all at once, then the impact on test scores, grade 4, will be negligible in Year 1, minor in Year 2, and better each successive year 3^{rd} – 6^{th}, and then probably show no substantial change after the 5^{th} or 6^{th} year that could be related to class-size, reductions, K-3. (The research-based recommended implementation schedule is K-1 in year 1, then add grades 2 and 3 in two successive years).
   3. Pressure from non-class-size participant parents for some help to get their children into smaller classes.
   4. Teacher concerns, especially teachers in grades that do not have small classes.
   5. Documentation of work adjustments of K-3 teachers who may now spend more time with parents or doing alternative assessments, or visiting in student homes, (etc). than 1) other teachers, 2) these teachers did prior to smaller classes, etc.

F. A focus on benefits other than test-score gains is useful. For example consider:

   1. Student behavior, as associated with discipline referrals, attendance/tardiness, participating in school events.
   2. Teacher behavior, such as better attendance, etc.
   3. See also item C.

G. Develop some indices of "comparability" of students now with 3 years prior to this time, and keep these demographic profiles during the class-size pilot (see below).

H. Are teachers in small classes systematically different from the average in the district on key things like training, tenure, certification, etc.?

I. Employ the best possible research design and methods under the circumstances. Can pupils be randomly assigned to classes? Teachers? Control groups? Comparison groups? Get help from researchers and evaluators.

J. The primary evaluation method may be a "time series" with several indicators of the past, such as a 3-year average for test scores, demographics, etc.. One model for comparisons is shown in Table IV-1.

Table IV-1. An Outline for Comparisons in Evaluating Class-Size Reduction. (Variables Might be Test Scores and Other Student Outcomes; Demographics and Context Issues). Years Are Expressed as Capital Letters.

YEARS for AVE.	INTERVENTION	ON-GOING PROCESSES	PRODUCTS or OUTCOMES
A + B + C / 3	D	E + F + G etc.	G, H
(Add several years of results and divide as appropriate for average to use as baseline).	Small Classes Start	Monitor details & "fidelity." Get anecdotes	Academics Behavior/ discipline Citizenship/ participation Development

START → Time of Events → IMPLEMENT → END

K. Comparisons will be influenced by state and local requirements, plus areas of interest to the local educators and community. (Work out details for each CSR effort).

1. Norms (state/national). Annually and cumulatively

2. District outcomes (total and/or disaggregated, such as by school, by student group—gender, race, etc.)

3. Comparisons to similar schools that have "regular" classes

L. Important outcomes will not only be test scores.

1. Use of space (alternatives, options)

2. Teacher energy levels; consideration of class-size change as "incentive" to work.

3. Use of technology to "connect" any satellite class space with its home school if space alternatives are employed.

4. How does this implementation differ from other implementations?

5. Long-term outcomes, such as dropout, special education, college attendance.

M. Needs and Questions. To make final determinations about the evaluation, other questions need answers:

1. What data are currently available to establish the "pre-test" or baseline data file?

2. What are future testing plans (for continuity of comparisons)?

3. What data do teachers want collected and analyzed?

4. How can evaluation information be collected and used with minimum disruption?

5. etc.

N. Other Points to Consider (Local or state requirements).

1.

2.

3.

4.

O. Disseminate the Evaluation Results

Be sure to make all data and reports available to many constituencies. Report honestly and forcefully. Use a variety of formats: reports, newsletters, letters to editors, discussion groups, fact sheets, etc. Leave reports at key places, such as offices, Laundromats, real-estate companies, school offices, senior-citizen homes, etc. Show benefits compared to costs or other alternative.

PART V References and Bibliography

(See also References in Appendix A)

A. Research Articles and Monographs

Achilles, C. M. (2000, August). Future leaders beware: Impostorship won't sell. Paper presented at NCPEA Annual Conference, Eastern Michigan University, Ypsilanti, MI.

Achilles, C. M. (1996). Summary of recent class-size research with an emphasis on Tennessee's Project STAR and its derivative research studies. Nashville, TN: TN. State University.

Achilles, C. M., Egelson, P. & Finn, J. D. (1998, November). Teaching in small classes: What is the difference? Paper presented at the Mid-South Educational Research Association (MSERA). New Orleans, LA.

Achilles, C. M., Harman, P. & Egelson, P., (1995, Fall). Using research results on class size to improve pupil achievement outcomes. Research in the Schools, 2, (2), 23-30.

Chase, C. I., Mueller, D. J. & Walden, J. D. (1986, December). PRIME TIME: Its impact on instruction and achievement. Final report, Indianapolis, IN: Indiana Department of Education.

Egelson, P., Harman, P. & Achilles, C. M. (1996). Does class size make a difference? Greensboro, NC: SouthEastern Regional Vision for Education (SERVE).

Finn, J. D. (1998, April). Class size and students at risk: What is known? What is next? Washington, DC: U.S. Department of education. Office of Educational Research and Improvement (OERI), AR 98 7104.

Finn, J. D., & Achilles, C. M. (1999, Summer). Tennessee's class size study: Findings, implication, misconceptions. Educational Evaluation and Policy Analysis, 21 (2), 97-107.

Finn, J. D., & Achilles, C. M. (1990, Fall). Answers and questions about class size: A statewide experiment. American Educational Research Journal, 27 (3), 557-577.

Finn, J., Gerber, S. B., & Achilles, C. M. et al. (2001). The enduring effects of small classes. Teachers College Record.

Gerber, S. B., Finn, J., Achilles, C. M., Boyd-Zaharias, J. (In Review). Teacher aides and student achievement. (EEPA).

Glass, G. V., & Smith, M. L. (1978). Meta-analysis of research on the relationship of class size and achievement. San Francisco: Far West Laboratory for Educational Research and Development.

Krueger, A. B. (2000, March). The effect of attending a small class in the early grades on college-test taking and middle school test results: Evidence from Project STAR. Princeton University. (Working paper).

Krueger, A. B. (2000, September). Economic considerations and class size. Princeton University, Industrial Relations Section. Working Paper #447.

Krueger, A. B. (1997, June). Experimental estimates of education production functions. Princeton, NJ: Princeton University, National Bureau of Economic Research Paper #6051. Cambridge, MA, also Quarterly Journal of Economics (1999), 114 (2), 497-532.

Krueger, A. B. & Whitmore, D. M. (1999, April). The effect of attending a small class in the early grades on college attendance plans. Executive Summary. Princeton University and NBER.

Molnar, A., Smith, P., Zahorik, J., Palmer, A., Halbach, A., & Ehrle, K. (1999, Summer). Evaluating the SAGE program: A pilot program in targeted pupil-teacher reduction in Wisconsin. Educational Evaluation and Policy Analysis, 21 (2), 165-178.

Smith, M. L. & Glass, G. V. (1979). Relationship of class-size to classroom processes, teacher satisfaction and pupil affect: A meta-analysis. San Francisco, CA Far West Laboratory for Educational Research and Development.

A1. Secondary Analyses of STAR Data by Non-STAR Personnel

Nye, B. A., Hedges, L. V., & Konstantopoulos, S. (1999, Summer). The long-term effects of small classes: A five-year follow-up of the Tennessee class size experiment. Educational Evaluation and Policy Analysis, 21 (2), 127-142.

Nye, B. A., Hedges, L. V., & Konstantopoulos, S. (2000, Spring) The effects of small classes on academic achievement: The results of the Tennessee class size experiment. American Educational Research Journal, 37 (1), 123-152.

B. Narratives and/or Reviews

Achilles, C. M. (1999). Let's Put Kids First Finally: Getting Class Size Right. Thousand Oaks, CA: Corwin Press.

Achilles, C. M., Finn, J. D., Pate-Bain, H. (1999, September). Class size: It's elementary. NASSP. Streamlined Seminar, 18 (1).

Educational Practices Panel Monitor (Quarterly). A "concerned citizen group" publication that tracks education progress in NYC, including CSR. ($15.00 for 3 years). EPP, 225 Broadway, Suite 3101, NY, NY 1007-3001.

Krueger, A. B. (1998, January). Reassessing the view that American schools are broken.. Princeton, NJ: Princeton University, Industrial Relations section working paper 395. (1998, March). FRBNY Economic Policy Review, 29-43.

Mosteller, F. (1995). The Tennessee study of class size in the early school grades. The Future of Children, 5 (2), 113-127.

Mosteller, F., Light, R. J., & Sachs, J. A. (1996, Winter). Sustained inquiry in education: Lessons from skill grouping and class size. Harvard Educational Review, 66 (4), 797-827.

Pritchard, I. (1999, March) Reducing class size. What do we know? Washington, DC: U. S. Department of Education.

U. S. Department of Education (2000, September). The Class-Size Reduction Program: Boosting Student Achievement in Schools Across the Nation: A First-Year Report. Washington, DC: Author.

C. Web Sites

U.S. Department of Education Class-Size Reduction Program:

http://www.ed.gov/offices/OESE/ClassSize

Project STAR:

http://www.heros-inc.org
http://www.reduceclasssizenow.org

Wisconsin's Project SAGE:

http://www.uwm.edu/Dept/CERAI/sage.html
http://www.educationanalysis.org

OTHERS:

Bracey, G. (8/2/00). http://www.america-tomorrow.com/bracey/EDDRA/EDDRA4.htm

West Ed: http://www.wested.org/

D. Edited Sources

Egelson, P. & Harman, P. (2000). A Compendium of SERVE Research on Class-Size Reduction. SERVE, POB 5367, Greensboro, NC 27435.

Egelson, P. & Harman, P., Hood, A. & Achilles, C. M. (2002)

Folger, J. (1989, Fall) Project STAR and Class Size Policy Peabody Journal of Education, 67 (1).

Grissmer, D. (1999, Summer). Educational Evaluation and Policy Analysis 21 (2). Special Issue Devoted to Class-Size Studies.

Wang, M. C. & Finn, J. D. (2000). How Small Class Help Teachers Do Their Best. Philadelphia, PA: Temple University, Center for Research in Human Development.

Wang, M. C. & Finn, J. D. (2002). Taking Small Classes One Step Further.

E. Research Reports

Burke County (NC) Public Schools. (1998, June) Reduced class size: (A summary of results, 1992-1993 through 1997-1998). Morganton, NC. Author

Prime Time. (See A. Chase et al., 1986)

SAGE. (See A. Molnar et al.)

Word, E., Johnston, J., Bain, H., Fulton, B., Zaharias, J., Lintz, N., Achilles, C. M., Folger, J., & Breda, C. (1990). The State of Tennessee's Student/Teacher Achievement Ratio (STAR) Project. Nashville, TN: Tennessee State Department of Education.

F. For Contrary Views that class size makes little or no difference, see numerous publications by E. Hanushek, or policy pieces that build on Hanushek's work, e.g.: Except for Hanushek, and persons who cite his work, we find no criticisms of small classes, except a few based on theoretic or hypothetical grounds (e.g., small classes are expensive), or unless the author confuses class size and PTR. (See Appendix A).

Hanushek, E. A. (1999, Summer). Some findings from an independent investigation of the Tennessee STAR experiment and from other investigations of class size effects. (sic). Educational Evaluation and Policy Analysis, 21 (2), 143-163.

Hanushek, E. A. (1998, February) The Evidence on Class Size. (sic) Rochester, NY: The University of Rochester: W. Allen Wallis Institute.

Ehrenberg,

APPENDIX A

Small Class (K-3) Benefits Are Supported by Research and Established Theories About Groups, Teaching, Learning, and School Outcomes.

I. LEARNING

A. Task Induction: Learn About School (Student's Work).

B. Mastery of Basics

C. Time On Task Increases.

D. Appropriate Homework

E. Child Development/ Developmentally Appropriate.

F. Early Intervention, Duration

II. TEACHING

A. Individual Accommodation.

B. Early Diagnosis and Remediation of Learning Difficulty.

C. Teach to Mastery.

D. Immediate Reinforcement.

E. Assessment (In-Class)

F. Effective Teaching Methods.

G. Planned, Coherent Lessons. (Seamless Transitions)

H. Portfolios, Running Records.

III. CLASSROOM

A. Classroom Environment (E.g.: Air Quality, Materials, Space, Crowding, Noise).

B. Personal Attention/ Community.

C. Inclusion, Special Needs

D. Variable Room Arrangements (E.g., Learning Centers).

E. Classroom Management.

F. Many Volunteers.

IV. "OTHER"

A. Increased Parent Involvement.

B. Reduced Grade Retention

C. Increased Teacher/Student Morale/Energy.

D. Teacher Accountability and Responsibility

E. Few Projects and "Pull Outs." (Coherence). Intensity

F. Assessment (Outcome)

V. STUDENT BEHAVIOR (Research in Progress).

A. Participation, Engagement, Identification.

B. Peer Interaction.

C. Cooperative Learning

D. Student-Led Activities

E. Group Dynamics.

F. Less Indiscipline

G. Cross-Age Events

APPENDIX B

Class Size and Pupil-Teacher Ratio (PTR) Confusion: Apples and Oranges

Hanushek (1998), often cited as an "expert" on class size, stated that the "conceptual ideal behind any measurement is important," and then made two key points: 1) ". . . pupil-teacher ratios are not the same as class sizes," and 2) "The only data that are available over time reflect the pupil-teacher ratios" (p. 12). Incredibly, Hanushek then criticizes class size by using PTR data.

Data available in large databases and surveys are generally PTR data. Valid and reliable ways to get class-size data are 1) to count the students in a class and/or 2) to establish class sizes and to monitor them as in Tennessee's Student Teacher Achievement Ratio (STAR) study. The following examples mix two very different concepts and generate confusion and questionable conclusions. (From Hanushek, 1998; C. Finn, 1997; Emphasis is added in each quotation).

> The findings of the general ineffectiveness of reducing class sizes tend to be controversial if for no other reason than they tend to defy common sense, conventional wisdom, and highly publicized accounts of the available scientific evidence. (Hanushek, 1998, p. 1).
>
> The discussion until now has focused on pupil-teacher ratios, but pupil-teacher ratios are not the same as class sizes. These data on pupil-teacher ratios reflect the total number of teachers and the total number of students at anytime, . . (Hanushek, p. 12).
>
> A policy decision to employ more teachers (such as by reducing pupil-teacher ratios, which have fallen from 27 to 1 to 17 to 1 over the past 40 years) is obviously different from a decision to hold class size constant . . . (C. Finn, 1997, pp. 48, 36).

The excerpts demonstrate problems inherent in basing class-size conclusions on PTR data. Hanushek generalized about "ineffectiveness" of class size but used PTR information. At best, his work offers some insights into PTR "evidence" and differences between PTR and class size. His findings substantiate that PTR changes have little impact on overall student outcomes measured at the site level.

Early "class size" discussions were based on PTR data. One concrete example from the STAR experiment makes the problem clear. (See Table A-1).

Widget Elementary School, grades K-5, has 529 students, with 261 in grades K-2 which are shown in detail (Table B-1). Kindergarten (K) has four STAR experimental classes with 86 students randomly assigned to 2 small (S), 1 regular (R), and 1 regular with a full-time aide (RA) classes. If not in STAR, Widget would have 3 K classes for 86 students. Grades 3-6 with three classes per grade (as in grades 1 and 2) have 268 students and 9 teachers. Ten other educators including administrator, counselor, media specialist, etc. also work at Widget. The 10 other educators and 19 classroom teachers give Widget a PTR of 529 divided by 29 positions, or 18.2. Only two of Widget's 19 classes—the two STAR (S) classes in K have fewer than 18.2 students. Other classes have 10-11 more students than the school's PTR of 18.2. The class-size range is 27-30 in non-STAR classes.

INSERT TABLE B-1 ABOUT HERE

If STAR were not in Widget, the three kindergartens for 86 students would average about 29. By participating in STAR and even being in the (R) class, a student would be in a smaller class than if STAR were not at Widget. In fact, if others in the school (e.g., aides, nurse, etc.) were counted in the PTR computation, the PTR could be 529 ÷ 32, or 16.5. The study by Miles (1995) in Boston and other studies of class size show that class size and PTR really are, in Hanushek's (1998) own words, "not the same" (p. 12). Just numerically, class size and PTR are about 10 students different, but conceptually and operationally they are worlds apart. These example show clearly some problems with substituting class size for PTR. (See Table B-2)

INSERT TABLE B-2 ABOUT HERE

Boozer and Rouse (1995) found important differences in class size and PTR outcomes. They addressed the PTR and class-size confusion directly. "The correlation between the pupil teacher ratio and the average class size is relatively low at 0.13 in the New Jersey Survey and 0.26 in the NELS" (p. 5, Footnote 8).

Boozer and Rouse's findings help explain why PTR changes do not have much influence on student outcomes. "Once again we find that the pupil teacher ratio does not (statistically) increase in schools with a larger proportion of black students, but that the average class size does." (p. 8) and . . . "On the other hand, students in schools with larger average class sizes have significantly smaller test-score gains (p. 8). Left unsaid is that PTR change is most often influenced by remedial efforts and "projects" like Title I, the nation's largest "remedial education" effort. They concluded this discussion with "The fact the school average class size matters, but pupil teacher (ratio) does not . . . (p. 9).

> . . . If remedial and special education classes have smaller class sizes and generate lower test score gains for a given class size than do high achieving classes, then the fitted regression line that ignores these differences will estimate an upward sloping relationship between class size and test score gains. This presents a serious problem for estimating education production functions. (p. 10. Emphasis Added).

Longer discussions of the confusion caused by substituting PTR results in discussions of class size appear in numerous research and policy papers.

Selected References*

Achilles, C. M., Finn, J. D. et al. (2000, December). The varieties of small classes and their outcomes. Paper prepared for the conference, "Taking small classes one step further." Sponsored jointly by the Laboratory for Student Success (LSS) at Temple University's Center for Research in Human Development and Education (CRHDE) and the U. S. Department of Education, Washington, DC: 11/30-12/1, 2000.

Boozer, M. & Rouse, C. (1995, May). Intraschool variation in class size: Patterns and implications. (ED 385935). Princeton, NJ: Princeton University, Industrial Relations Section Paper #344. National Bureau of Economic Research, Cambridge, MA.

Borman, G. D. & D'Agostino, J. V. (1996, Winter). Title I and student achievement; a meta-analysis of federal evaluation results. Educational Evaluation and Policy Analysis, 18 (4). 309-326.

Finn, C. E. Jr. (1997, October 29) The real teacher crisis. Education Week, 48, 36.

Hanushek, E. A. (1998, February) The Evidence on Class Size. Rochester, NY: The University of Rochester. W. Allen Wallis Institute.

Krueger, A. B. (2000, March). "An Economist's View Of Class Size Research. *CEIC Review*, Philadelphia, PA: Temple University, Center for Education in the Inner Cities. 9 (2), Marcy 2000. 19-20.

Miles, K. H. (1995, Winter). Freeing resources for improving schools: A case study of teacher allocation in Boston public schools. Educational Evaluation and Policy Analysis (EEPA), 17 (4), 476-493.

Wong, K. K. & Meyer, S. J. (1998, Summer). Title I schoolwide programs: A synthesis of findings from recent evaluation. Education Evaluation and Policy Analysis, 20 (2), 115-136.

* Note. Tables and information in Appendix B here also appear in Achilles, C. M. (1999) Let's Put Kid's First, Finally, and in several working papers. For example Appendix B material here is part of a much longer explanation in Achilles, C. M. (2000, August). Future leaders beware: Impostorship won't sell. Paper presented at NCPEA Annual Conference, Eastern Michigan University, Ypsilanti, MI.

Table B-1. Example of Class-Size and Pupil-Teacher Ratio (PTR) Difference.

Grade and Classes	(n)
Kindergarten N=86 (STAR)	
Small	16
Small	16
Regular	27
Regular-Aide	27
Grade 1 N=88	
A	29
B	30
C	29
Grade 2 N=87	
A	29
B	29
C	29
Totals (K-2)	
Students	261
Teachers	10
Totals (3-5)	
Students	268
Teachers	9

Computation *
Total Students N=529

Other Educators

Title	N
Principal	1
Counselor	1
Media Specialist	1
Special Education	2
Title I	3
Art	.5
Music	.5
Physical Education	.5
Gifted	.5
Total "Other"	10
Total Regular	19
Total Educators	29

School-wide PTR = 529÷29 or 18.2
Average class size = 529÷19 or 27.8

* This excludes aides (n=4), secretary (n=1) and nurse (n=.5) whose salaries could add the equivalent of 3 more professional positions, providing a PTR of 529 ÷ 32 or 16.5. Widget Elementary, a STAR School has 261 students in grades K-2, and 529 students, K-5. From Achilles, 1999, p. 33.

Table B-2. Some Major Differences Between Class Size (CS) or Class-size Reduction (CSR) and Pupil-Teacher Ratio (PTR).

VARIABLES of note in comparing PTR and CS	PUPIL-TEACHER RATIO (PTR)	CLASS SIZE (CS) or (CSR)
Definition	Students (n) at a site (building, district, class) divided by: teachers, educators, adults, (etc.) serving the site.	Students (n) in a teacher's room regularly.
Computation	DIVISION, with various divisors available depending upon the EXACT definition.	ADDITION. This cannot be accurately determined from large databases.
Concept	The teacher needs help; the student needs special services the teacher cannot provide.	A competent teacher can handle most education issues if given a reasonable case load.
Operation and Context	A project and "pull-out"-driven model full of commotion and "Band Aid" treatments. Loss of time on task. Difficulty in determining responsibility and accountability.	Teacher is responsible and accountable for the student's growth and development: Academics, Behavior, Citizenship, Development, (A, B, C, D) Small focused learning groups.
Outcomes	CONSISTENTLY MARGINAL. Note, for example, education "production function" analyses; Title I evaluations, Borman and D'Agostino (1996) Wong and Meyer (1998), Boozer and Rouse (1995), etc.	CONSISTENTLY POSITIVE on many variables (A, B, C, D). Much consensual validation, anecdotal evidence, and "common-sense" support.

Small Class Fact Sheet

What the research tells us

October 2000

Is there a solid research base supporting class size reduction? Yes!

✓ Research studies prior to Tennessee's Project STAR lead to the conclusions that:

- "Reduced class size can be expected to produce increased academic achievement" and "The major benefits from reduced class size are obtained as the size is reduced below 20 pupils."

- "Small classes are most beneficial in... the early primary grades" and "Students who are economically disadvantaged or from some ethnic minorities perform better academically in smaller classes."

✓ Project STAR (Student-Teacher Achievement Ratio), a large-scale longitudinal controlled scientific experiment, demonstrated equivocally that small classes in Grades K-3 have short-term and long-term academic benefits. STAR built on the prior research. (See box)

✓ Project STAR analyses have been replicated by other researchers using a range of statistical approaches.

✓ Project STAR findings have been replicated in other sites, including Wisconsin's Project SAGE (30 schools serving students from low-income homes), Tennessee's Project Challenge (16 of the State's poorest districts), and in Burke County, NC, High Point, NC, and Fairfax County, VA.

What are the most important findings?

Immediate impact

✓ Pupils in small classes in K-3 performed significantly better *in all academic subjects in every grade* compared to pupils in full-size classes.

The benefits ranged from approximately 3/4 month advantage at the end of Kindergarten to 3 to 5 months advantage at the end of Grade 3 in all subjects

✓ In each grade, the small-class advantage was greater for minority students than for white students - often as much as two to three times greater - reducing the Black-White achievement gap.

✓ Both *starting early* and *continued participation* in small classes lead to greater benefits.

For example, STAR pupils in Grade 2 who had been in small classes for three years (since kindergarten) had a 5.8-month advantage in reading over pupils in full-size classes. Pupils who had been in small classes for two (Grades 1 and 2) years had a 3.7-month advantage. Pupils who were in small classes for the first time in Grade 2 had a 1.8-month advantage.

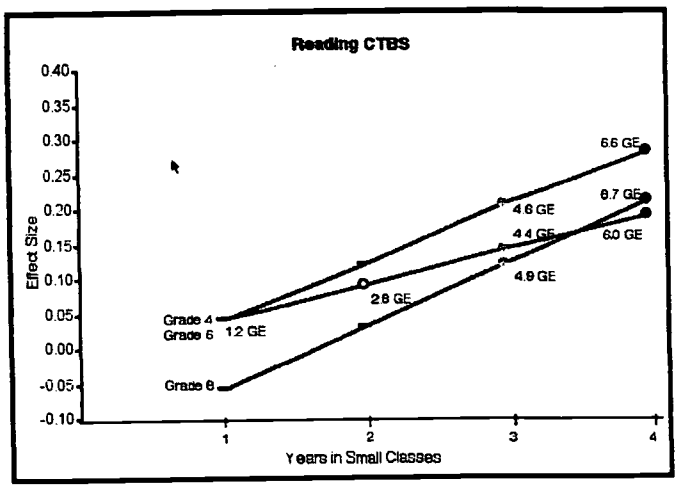
✓ Pupils attending full-size classes with a full-time teaching assistant (aide) showed *no academic advantages* over pupils in classes without a teaching assistant.

Long-term impact

✓ Pupils who attended small classes in K-3 perform significantly better in all academic subjects in Grade 4 and on most tests in Grades 6 and 8. The impact of small classes continued for at least five years after all students returned to full-size classes.

✓ The more years a pupil spent in small classes, the longer the benefits lasted.

For example, at the end of Grade 6, pupils who had attended small classes for one year had a 1.2-month advantage in reading over pupils who attended full-size classes *(see graph)*. Pupils who attended small classes for 2 years had a 2.8-month advantage. Three years produced a 4.4-month advantage, and four years produced a 6-month advantage. The same pattern was observed in every academic subject



✓ Pupils who attended small classes in K-3 were more likely to graduate from high school and more likely to take SAT/ACT college admissions tests. The effect was particularly strong for minority students, reducing the Black-White gap in the probability of taking college admissions tests by half.

Three cautions about applying the STAR results in other settings

✓ Teacher preparation: No special training or instructions or special curricula or materials were given to Project STAR teachers. The benefits arose because *class sizes were smaller*. However, the STAR teachers were all certified and had a range of years of teaching experience. Sites that do not have a pool of experienced teachers to draw upon may wish to provide orientation programs for new teachers, workshops in essential skills (e.g., classroom management, student evaluation and remediation), and professional support and feedback during their beginning months in the classroom.

Features of Tennessee's Project STAR

✗ STAR was a controlled scientific experiment.

• Pupils entering kindergarten in 1985 were assigned at random to a small class (13-17), a regular class (22-26), or a regular class with a full-time teacher aide *within each participating school*. Teachers were assigned at random to the classes.

• The class arrangement was maintained all day, all year long. *There was no other intervention*, for example, no special training for teachers and no special curricula or materials were used. Other services were available as usual for example, special education programs.

• Pupils were kept in the same class grouping for up to four years (Grade 3); a new teacher was randomly assigned to the class each year. All pupils returned to full-size classes in Grade 4.

✗ STAR had large, diverse samples.

• The first year involved approximately 6300 pupils in 79 schools - over 300 classrooms - in 46 districts. The second year was larger. During the four years, almost 12,000 students participated in all.

✗ Extensive data were collected.

• Both *norm-referenced and criterion-referenced achievement tests* were administered in the spring of each year. Other measures (e.g., motivation, classroom behavior, special education placements) were gathered regularly.

• STAR participants were followed after they returned to regular-size classes - through high school. Achievement test results were collected annually through Grade 9. Graduation status and SAT/ACT scores were collected in Grade 12. Further data continue to be collected.

✗ Analyses of the data using different statistical approaches gave the same answer.

✓ **Class size matters, NOT the pupil-teacher ratio**: STAR small classes ranged from 12-17 pupils. It is likely that similar benefits will be obtained as long as classes have fewer than 20 pupils. However, the STAR results apply *only when the number of students in the room is actually less than 20*. The STAR research does not apply to other classroom organizations (e.g., team teaching). Moreover, the same effects are unlikely to occur if a school's pupil-teacher ratio is changed but classes continue to have more than 20 pupils.

✓ **Don't expect miracles**: Small classes may not be the 'silver bullet' that will cure all problems of underachievement or eliminate the white-minority achievement gap. However, reducing class sizes in the elementary grades has been shown to have positive effects on pupils and teachers - especially if small classes begin in Kindergarten or Grade 1. Few (if any) other educational interventions are based on scientific evidence as strong. Small classes are best viewed as an *essential facilitating condition* that enable teachers to exercise the best in teaching practices. They should be used as a foundation on which other approaches to enhancing pupil performance can be built.

What is the current status of Project STAR?

The STAR data are housed at HEROS, Inc., in Lebanon, TN. Achievement test results for all pupils in K-3 are available on the Internet (below). STAR researchers are continuing to collect information about the STAR participants through high school and beyond. This research will examine the impact of small classes in K-3 on long-term outcomes, for example, college attendance and employment.

Where to find further information

Some published sources

Achilles, C. M. (1999). *Lets put kids first, finally: Getting class size right*. Thousand Oaks, CA: Corwin Press.

Finn, J. D., & Achilles, C. M. (1999). Tennessee's Class Size Study: Findings, Implications, Misconceptions. *Educational Evaluation and Policy Analysis*, Vol. 21 (No. 2), pp. 97-109.

Mosteller, F. (1995). The Tennessee study of class size in the early school grades. *The Future of Children*, Vol. 5 (No. 2), pp. 113-127.

U. S. Department of Education (September 2000). *The class-size reduction program: Boosting student achievement in schools across the nation*. Available on the Department website.

Websites

U.S. Department of Education Class-Size Reduction Program:

http://www.ed.gov/offices/OESE/ClassSize/

Project STAR:

http://www.heros-inc.org
http://www.reduceclasssizenow.org

Wisconsin's Project SAGE:

http://www.uwm.edu/Dept/CERAI/sage.html
http://www.educationanalysis.org

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APPENDIX D *

THE BLACK-WHITE TEST SCORE GAP

Christopher Jencks, Harvard University; Meredith Phillips, UCLA

THE BLACK-WHITE TEST SCORE GAP

- Reading and Mathematics scores rose for both African American and white students at all ages between 1971-1996, but African Americans increased more
- African American students scored lower than white students in vocabulary, reading, and mathematics tests, as well as tests that claim to measure scholastic aptitude and intelligence
- African American children arrive at kindergarten with few reading skills even when their parents have equal years of schooling
- Even though the gap has narrowed substantially, racial disparities are still very large

RESEARCH FINDINGS

- Research indicates that ½ of the Black-White Gap in 12th grade reading and math was explained by differences in 1st grade scores
- The teacher expectations have more impact on African American students' performance than on white students' performance
- The test score gap between economically advantaged and disadvantaged children widens more over the summer then during the school year
- Exhorting teachers to have more faith in black children's' potential is unlikely to change their expectations
- Teachers expect less of African American students than white students because of student past performance and behavior (no evidence that teacher expectations differed by race)
- Rigorous interventions do effect IQ and cognitive skills at every stage of life
- Most of the divergence between African American students and white students with initially similar scores occur before high schools
- Evidence is mixed regarding whether African American children learn more in classes taught by African American teachers
- Class size matters more for African Americans
- Research tends to find that teachers who attend better colleges or scored higher on standardized examinations are more successful helping children score higher
- Different parenting practices may account for some of the black-white gap

WHAT CAN SCHOOLS/SCHOOL SYSTEMS DO?

- Increase the number and quality of preschool programs (more focus on cognitive skills)
- Raise teacher expectations
- Increase academic preparation of teachers
- Provide staff development programs that focus on successful instructional methods/programs
- Reduce class size in the early years
- Promote better parenting practices/programs for all parents (match the school and home environments)
- Get support from community organizations to attack this gap problem
- Raise academic preparation of teachers
- Improve summer programs especially for at-risk students
- Implement programs that have been effective in other systems
- Encourage students to take more rigorous academic programs
- Success comes from coordinating human resources around a well defined goal, constantly assessing progress toward that goal and never giving up until success is achieved

* Summary provided by Michael E. Glascoe as a class assignment (12/00).

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