DOCUMENT RESUME

ED 459 594 EF 006 032

AUTHOR Robertson, Sue
TITLE The Great Size Debate. IssueTrak: A CEFPI Brief on Educational Facility Issues.
INSTITUTION Council of Educational Facility Planners, International, Scottsdale, AZ.
PUB DATE 2001-08-00
NOTE 5p.
AVAILABLE FROM Council of Educational Facility Planners International, 9180 E. Desert Cove Dr., Suite 104, Scottsdale, AZ 85260. Tel: 480-391-0840; Fax: 480-391-0940; e-mail: cefpi@cefpi.org; Web site: http://www.cefpi.org. For full text: http://www.cefpi.org/issuetraks.html.
PUB TYPE Information Analyses (070)
EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Academic Achievement; Elementary Secondary Education; Public Schools; *School Size; *Small Classes; Student School Relationship

ABSTRACT

This report reviews research that compares large schools to small schools in such areas as academic performance, class size benefits, operational problems, and student social development. A list of small school benefits for students, families, teachers, and the institution is included. The research indicates that as more schools-within-schools begin to function autonomously, they may yield desired student benefits at the most reasonable investment in capital and operations. While smaller classrooms appear to improve academic performance, some research also indicates that smaller class sizes can reduce teenage pregnancy rates and the need for disciplinary action. However, greater numbers of smaller classrooms are creating shortages of qualified teachers who can implement successful classroom learning. Efforts to provide smaller classrooms are also forcing school districts to quickly devise capital programs to address greater classroom numbers. Most of the research reviewed concludes that smaller class and school sizes are beneficial, with the greatest positive impact occurring for students from poorer families. Evidence supports the school-within-a-school approach and significant class size reductions in the primary grades. (Contains 14 references.) (GR)

Reproductions supplied by EDRS are the best that can be made from the original document.

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
This document has been reproduced as received from the person or organization originating it.
Minor changes have been made to improve reproduction quality.
Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

CEFPI
The School Building Association

ISSUETRAK

A CEFPI Brief on Educational Facility Issues

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL HAS BEEN GRANTED BY

T. Wall

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

ED 459 594

Topic : The Great Size Debate

Issue Tracker: Sue Robertson

Date Filed: August 2001

CEFPI BRIEF

Is bigger always better? In America we seem to think so. However, when it comes to school size and class size, the debate can become heated. Proponents of "smaller" cite negative examples, such as the impersonal culture of 'mega-schools'. "Large" school advocates argue 'economy of scale'. Which is better? What does the research say?

School Size

During the 1920's, school districts created larger schools [primarily through consolidation] for administrative and instructional purposes. Administrative benefits focused on economy of scale, while instructional benefits were to be derived from having better educated instructors offer a broader curriculum [Howley, 1996].

There were several leaders in this movement. Ellwood Cubberly was a former urban superintendent. When faced with burgeoning immigrant populations in urban areas, he believed the solution to education was answering, "How large a school can be created?" Joseph Kennedy, dean of the School of Education at North Dakota State University, approached the school size issue from a rural perspective. Faced with consolidation of multiple, very small, community based schools, he asked, "What is the lower limit of school size?" He expressed concerns about losing the identity and participation of the local communities as schools were consolidated [Howley, 1996].

During the period from 1940 to 1990, the number of K-12 schools in the United States declined by 69%. Meanwhile, there was a 70% increase in U.S. population. Several ideas may have driven this trend toward consolidation. In order to win the 1950's space race with the Soviet Union, it seemed that we needed larger schools to produce more scientists. In 1959, James Conant published a pivotal study that argued for larger schools. He asserted that they would be more cost efficient and could offer a more varied curriculum. Today, it is considered ironic that his arguments for the creation of high schools with 100 students per grade level are used to justify mega-enrollments. [AASA Leadership News, 2000] Currently, more than 70% of students in U.S. high schools attend a school with more than 1,000 students [Cotton, 2000].

Distances and topography were cited as obstacles in consolidating rural schools. However, those issues also factor into size and location of schools in urban and suburban areas. Factors that increase success, such as parent involvement, are difficult if students are drawn from a widespread attendance area and transportation is not readily available [Howley, 1996].

School size has been studied extensively to determine whether student outcomes are attributable to size or to other variables, such as rural or urban setting or socio-economic status. Since many small schools are in rural settings, research has been designed to determine if positive effects are a result of the rural environment or school size. These studies indicate that favorable results can be attributed to school size. Data was collected on 251,049 students in grades K-12 in 291 elementary, middle, and high schools in an urban Texas district. Female students were shown to be negatively affected by large school size at all grade levels, while male students were only negatively affected at the high school level [La Sage & Ye, 2000].

One of the indicators for optimal size is socio-economic status. Research conducted by Craig Howley, Ohio University, and Robert Bickel, Marshall University, found that smaller schools help to mitigate the negative effects of poverty in student performance. These effects were consistent in school systems as diverse as those of Georgia, Ohio, and Texas. When controls for race were introduced, results did not change significantly. In Montana, which has primarily smaller schools, small school results were stronger for all socio-economic levels [AASA Leadership News, 2000].

A study conducted by Valerie E. Lee, University of Michigan, and Julia B. Smith, Western Michigan University, suggests that the most effective size for a high school is 600-900 students. Students in smaller schools or considerably larger schools [over 2,100] tend to learn less. Large schools were found to impact low SES [socio-economic status] students more negatively than other groups [Lee, 1997].

A frequently cited disadvantage of small schools is limited curricular offerings. The argument is that there is not a large enough pool of interested students to offer specialized or advanced courses. Small schools [high schools as small as 400

EC006032
ERIC
BEST COPY AVAILABLE

students] certainly have sufficient numbers to offer all of the nationally recommended courses for graduation. Researchers have found that the smallest schools do offer fewer advanced courses, but research also indicates that large school size is no guarantee that advanced courses will be offered or highly enrolled. Many small schools are compensating for small demand in advanced courses through agreements with institutions of higher education or in distance learning collaborations. Larger schools can offer more specialized courses, but small schools can approach these offerings with shared programs and focused offerings geared to student needs. The optimal curriculum seems to be more a function of clear goals and creative implementation than size of student body [Raywid, 1996].

Technology is an important component in making small schools work. The ability to access resources from the Internet and through distance learning greatly increases the options available to students. Small schools also offer the opportunities for flexibility that can foster individualization to tailor the learning program to the student's needs. Smaller schools don't guarantee success. Small schools, however, tend to have environments that make success more likely [Raywid, 1996].

Benefits of Small Schools

Student/Family Benefits	Teacher Benefits	Institutional Benefits
• Especially helpful for low SES • Better attendance & retention • Better behavior • More engagement and greater sense of belonging • Better academic achievement • Increased participation in extra-curricular activities • Greater parent involvement. Students and parents have easier access to teachers and administrators. • More positive self image	• More commitment to the school and to the students • Greater participation • Expend more effort for student success • Allows for greater diversity in program delivery options [team teaching, multi-age grouping, etc.]	• More effective governance • Better support of staff and students • More helpful advising • Less bureaucracy • Participants are more empowered • Reform is easier. Small numbers allow ideas to be tried and fine-tuned. • Schools are safer

[Roellke]

For small schools to be truly effective they must function differently than large schools, not just contain fewer students. Smallness allows for better functioning but doesn't guarantee it. Schools-within-schools can co-exist within a building but must function autonomously to garner small-school benefits. They should have separate budgets and administration. Locating several small schools within a building allows sharing of common areas such as dining and assembly areas. A house plan is a less autonomously separate form of organization. Typically, houses share not only common areas, but also administration, guidance, and media centers.

As more "schools within schools" begin to function autonomously, we may find that this solution yields desired student benefits at the most reasonable investment in capital and operations. Meanwhile, the debate is likely to continue.

Class Size

Class size reduction is a topic about which everyone has an opinion. It seems intuitively obvious that smaller classes could be better managed and thus may produce better learning outcomes. The federal government, states, and local districts throughout the country are generating funding to reduce class size. However, this issue has very costly capital and operations impacts. [McRobbie, et al 1998] Do students really learn more in smaller classes? If so, what is happening in these classes that helps students learn more? What teaching strategies can be implemented to increase and maintain student gains? What changes in facilities are needed to support these changes?

Tennessee's Student/Teacher Achievement Ration Project [Project STAR] is a long-term experiment to examine effects of reduced class size on student performance. The study included suburban, inner city, urban, and rural schools, including 6,500 students in 330 classrooms. [WEAC] It began with kindergarten students entering school in 1985 and continued for four years. A follow-up investigation considered short-term academic outcomes [test scores during the initial 4 years and through grade 8], long-term academic outcomes [whether students took the ACT and SAT exams and actual scores on ACT and SAT exams], and long-term non-academic outcomes [teen birth and incarceration rates]. Students were assigned to a small class [13-17 students], a regular-sized class [22-25 students], or a regular-sized class with a teacher-aide in addition to the teacher. After grade 3 all students returned to regular-sized classes [Krueger & Whitmore, 2001].

While students were in the initial 4 years, black students' average test scores increased by 7-10 percentile points, and white students' scores increased by 3-4 percentile points. After students returned to regular-sized classes the small class gains fell to 5 percentile points for black students and 1.5 percentile points for white students. They tend to remain at that level through grade 12 [Krueger & Whitmore, 2001].

Those students who attended small classes have an increased likelihood of taking the SAT and the ACT exams. The likelihood of black students from regular classes to take the college entrance exams was 31.8%, and the likelihood of black students from small classes taking those exams increased to 41.3%. For white students who attended regular classes, the likelihood of taking the college entrance exams was 44.7%, while those who attended small classes had a likelihood of 46.4%. Scores of students who had attended a small class were higher by a standard deviation of 0.15-0.20 for black students and by 0.04 for white students [Krueger & Whitmore, 2001].

There was also a long-term effect on teen birth rates. The teen birth rate for white females who had attended the larger classes was 4.8%, and for those from the smaller classes, the rate was 3.2%. The fatherhood rate for black teenage males was 2.5% if they had attended a regular class and 1.5% if they had attended a smaller class [Krueger & Whitmore, 2001].

Another phase, called Project Challenge, looked at the state-wide performance ranking of the 17 economically poorest school districts. When these districts implemented small class sizes for kindergarten through grade 3, their end-of-year results went from considerably below average to well above average in reading and math [Mosteller, 1995].

The Educational Testing Service also conducted a research study that investigated the relationship between spending for smaller classes and student achievement at grades 4 and 8. The study was authored by Harold Wenglinsky and published in 1997. Spending for small classes seemed to have a direct positive effect on student achievement in grade 4 with a more complicated and less definitive outcome in grade 8 [WEAC].

A major issue that hasn't been clearly investigated is: how small? STAR researchers surmise that as classes increase beyond 17, the positive benefits diminish. However, the "drop factor" must come into the argument. A reduction in class size from 30 to 17 is clearly significant. It seems less likely that a drop from 20 to 17 would have as much impact. More research must be done before a critical class size or size range is determined. The STAR research indicates that smaller groupings within large classes do not yield the positive effects of small class size [McRobbie, et al, 1998]. It may be that a range of smaller size, rather than an absolute target, provides school districts greater potential to maximize benefits by redistributing resources and creative scheduling.

At this point it does not appear that significant changes in pedagogy are transpiring as a result of smaller class size. However, teachers are spending a little less time on discipline. This freeing-up of time may simply allow teachers to spend more time implementing strategies that they know will work. Students need both individual and group instruction. Smaller groups are easier to manage as they engage with each other in active, hands-on learning. More time with each student allows the teacher to more closely monitor student progress and provide reinforcement and repetition as needed. Having fewer students in a class appears to allow for more individual attention from the instructor [O'Connell & Smith, 2000].

In areas where many under-qualified teachers were quickly hired to meet desired ratios, the results have not been as promising. Effective teaching behaviors are essential to successful classroom learning. Staff development needs to be a focused on-going commitment as part of making small class size expenditures effective. [O'Connell & Smith, 2001] California rapidly implemented a class size reduction plan, resulting in an acute shortage of qualified teachers. That experience argues for a phased implementation plan [Picus, 2000].

Finding adequate space to house the increased number of small classes also proves to be challenging. Due to short implementation timelines, many districts have used portable classrooms extensively. Districts are also re-assigning various spaces, such as Art or Music classrooms as regular grade-level spaces. While these may be adequate short-term solutions, a capital program must quickly be devised to address needs for increased classrooms.

Decreasing class size at all grade levels definitely requires more classrooms. The following table illustrates the differences in number of classrooms needed for lower and higher class sizes in a 400-student, grades K-5, elementary school:

Building Capacity	400	400
Students Per Class	25	18
Total Number of Classrooms Needed	400/25=16	400/18=22

There is some speculation in the literature that small class sizes are most effective at the primary level, and some districts are electing to decrease class size in the primary grades only. If changes were made in only grades K-3, the effect would be:

Building Capacity	K-2= 200 3-5=200	K-2= 200 3-5=200
Students Per Class: Grades K-2	25	18
Number of Classrooms Needed: Grades K-2	200/25=8	200/18=11
Students Per Class: Grades 3-5	25	25
Number of Classrooms Needed: Grades 3-5	200/25=8	200/25=8
Total Number of Classrooms Needed	16	19

A savings of 3 classrooms per school may seem insignificant until it is multiplied over all the schools in the district. At that point savings in capital and operations becomes significant. Until further research is conducted that conclusively proves small class benefits at the upper grade level, decreasing class size, at least in the lower grades, seems prudent.

An additional problem in determining whether benefits justify additional costs is the difficulty in assigning economic value to potential long-range outcomes. In general, the studies suggest that disadvantaged students [low SES, minorities, and low achievers] benefit the most from smaller class size [Krueger & Whitmore, 2001]. How does one assign a dollar value to increases in college attendance or reduction in teen pregnancies? It seems reasonable to project that these students would lead more productive lives with less disruption to society. That is clearly a benefit that extends beyond staffing or capital costs.

Conclusion

Most of the research reviewed concludes that smaller class and school sizes may be beneficial. The impact seems to be greatest for lower SES students. The debate is likely to continue for quite some time as more research is conducted and more options explored. Meanwhile, intermediate solutions like school-within-a-school and reducing class size significantly in primary grades appear to be advisable.

REFERENCES:

American Association of School Administrators-Issues & Insights. [February 21, 2000]. Smaller Schools Reduce Poverty's Damaging Effects. Retrieved April 2, 2001 from the World Wide Web: http://www.aasa.org/publications/ln/02_00/02_21_00smallschools.htm

American Association of School Administrators-Issues & Insights. Curriculum Adequacy and Quality In High Schools Enrolling Fewer Than 400 Pupils [9-12]. Retrieved April 3, 2001 from the World Wide Web: http://www.aasa.org/issues_and_insights/district_organization/roellke_adequacy.htm

Cotton, K. [2000]. School Size, School Climate, and Student Performance. Retrieved April 11, 2001 from the World Wide Web: http://www.nwrel.org/scpd/sirs/10/c020.html

Howley, Craig. [1996]. Ongoing Dilemmas of School Size: A Short Story. Retrieved April 3, 2001 from the World Wide Web: http://www.aasa.org/issues_and_insights/district_organization/howley_dilemmas.htm

Krueger, A.B. & Whitmore, D.M. [March 2001]. Would Smaller Classes Help Close the Black-White Achievement Gap? Princeton University, Industrial Relations Section, Working Paper #451. Retrieved April 25, 2001 from the World Wide Web: http://www.irs.princeton.edu/pubs/pdfs/451.pdf

La Sage, E. & Ye, Renmin. [2000]. A Study on the Relationship Between Students' Achievement, School Size and Gender. [ERIC Document Reproduction Service No. ED445072]. Retrieved from the World Wide Web: http://ericir.syr.edu/plweb-cgi/fastweb?getdoc+ericdb-adv+ericdb+1045252+4+wAAA+

Lee, V. [Fall 1997]. High School Size: Which Works Best and for Whom? [Abstract]. Educational Evaluation and Policy Analysis, Vol. 19, No. 3. Retrieved from the World Wide Web: http://www.aera.net/pubs/eepa/abs/eepa1932.htm

McRobbie, J., Finn, J.D. & Harman, P. [August 1998]. Class Size Reduction: Lessons Learned from Experience. WestEd Regional Educational Laboratory. Policy Brief #23. Retrieved from the World Wide Web: http://www.wested.org/policy/pubs/full_text/pb_ft_csr23.htm

Mosteller, F. [Summer/Fall 1995]. The Tennessee Study of Class Size in the Early School Grades. The Future of Children. Vol. 5. No. 2. Retrieved April 2, 2001 from the World Wide Web: http://www.futureofchildren.org/cri/08cri.htm

O'Connell, J. & Smith, S.C. [April 2000]. Capitalizing on Small Class Size. [ERIC Digest Number 136]. Retrieved from the World Wide Web: http://www.ed.gov/databases/ERIC_Digests/ed440430.html

Picus, L.O. [Fall 2000]. Class-Size Reduction: Effects and Relative Costs. ERIC Clearinghouse on Educational Management. University of Oregon, College of Education. Retrieved from the World Wide Web: http://eric.uoregon.edu/hot_topics/class_size.html

Raywid, M.A. [March 1996] Downsizing Schools in Big Cities. [ERIC Digest No. 112]. Retrieved March 25, 2001 from the World Wide Web: http://www.ed.gov/databases/ERIC_Digests/ed393958.html

Roellke, Christopher. Curriculum Adequacy and Quality in High Schools Enrolling Fewer Than 400 Pupils [9-12]. American Association of School Administrators - Issues and Insights. Retrieved from the World Wide Web: http://www.aasa.org/issues_and_insights/district_organization/roellke_adequacy.htm

Wisconsin Education Association Council. Great Schools Issue Paper: Reduced Class Size. Retrieved from the World Wide Web: http://www.weac.org/sage/research/gsclasssize.htm

ISSUETRAK is prepared by The Council of Educational Facility Planners International as a service to its membership.

CEFPI wishes to thank **Sue Robertson** for her invaluable time and expertise in preparing this brief.

Sue Robertson has a B.S. in Elementary Education and a M.S. in Interior Design. As an educational planner, Sue has assisted numerous districts in developing educational specifications, community consensus building, and district-wide master planning. For additional information, you may contact Sue at srobertson@planning-alliance.com

The opinions expressed in this article are those of the author and do not necessarily reflect the position of the Council of Educational Facility Planners International, its officers or membership.

THE COUNCIL OF EDUCATIONAL FACILITY PLANNERS INTERNATIONAL
9180 E. Desert Cove Dr., Suite 104 Scottsdale, AZ 85260
Phone: 480.391.0840 Fax: 480.391.0940 email: cefpi@cefpi.org www.cefpi.org

© 2001 by CEFPI

U.S. Department of Education
Office of Educational Research and Improvement (OERI)
National Library of Education (NLE)
Educational Resources Information Center (ERIC)

NOTICE

REPRODUCTION BASIS

☒ This document is covered by a signed "Reproduction Release (Blanket) form (on file within the ERIC system), encompassing all or classes of documents from its source organization and, therefore, does not require a "Specific Document" Release form.

☐ This document is Federally-funded, or carries its own permission to reproduce, or is otherwise in the public domain and, therefore, may be reproduced by ERIC without a signed Reproduction Release form (either "Specific Document" or "Blanket").