REL Appalachia Ask-A-REL Response

Rural

September 2017

Question:

What research is available on the impact of class size on student outcomes in rural settings?

Response:

Thank you for your request to our REL Reference Desk regarding evidence-based information about the impact of class size in rural settings. Ask-A-REL is a collaborative reference desk service provided by the 10 Regional Educational Laboratories (RELs) that, by design, functions much in the same way as a technical reference library. Ask-A-REL provides references, referrals, and brief responses in the form of citations in response to questions about available education research.

Following an established REL Appalachia research protocol, we searched for research reports and descriptive study articles on the impact of class size in rural settings. The research literature uses the terms class size and student-teacher ratios to discuss this issue, therefore, results include abstracts that included these two terms. The search results did not provide any studies that exclusively focused on class size in rural settings. However, several studies included rural settings in their samples and described results as they relate to rural settings. In our response, we included notes that point the reader to the relevant information in the research papers. The sources included ERIC and other federally funded databases and organizations, research institutions, academic research databases, and general Internet search engines. For more details, please see the methods section at the end of this document.

The research team did not evaluate the quality of the resources provided in this response; we offer them only for your reference. Also, the search included the most commonly used research databases and search engines to produce the references presented here, but the references are not necessarily comprehensive, and other relevant references and resources may exist.

References

Egelson, P., Harman, P., & Achilles, C.M. (1996). *Does class size make a difference? Recent findings from state and district initiatives.* Greensboro, NC: Southeastern Regional Vision for Education. Retrieved from http://eric.ed.gov/?id=ED398644

From the abstract: "Research has indicated that educators view class size as a factor in improving student learning. This publication summarizes findings about some recently implemented class-size initiatives. It highlights results from Tennessee's reduced class-size experiment of the 1980s; summarizes the efforts and results from other recent state-level initiatives (Florida, Nevada, Virginia, and Wisconsin); focuses on the efforts and results of a reduced class-size initiative in Burke County Schools, North Carolina; discusses the findings from and applications of these class-size initiatives; and provides an extensive reference section to enable educators to further explore issues surrounding class-size initiatives. Implemented in 1990, the Burke County initiative appears to have resulted in expanded classroom space, improved classroom management, strengthened instruction and assessment, enhanced student concept and relationships with peers, and improved teacher-parent communication. Data also show that students in the reduced-size classrooms had higher standardized test scores in reading and mathematics than did students in the control group. Issues to be dealt with include cost, allocation of classroom space, and the loss of teaching assistants in primary grades."

Note: "Rural" mentioned on page 20 when describing Burke County Schools and community.

Farmer, T. W., Leung, M. C., Banks, J., Schaefer, V., Andrews, B., & Murray, R. A. (2006). Adequate yearly progress in small rural schools and rural low-income schools. *Rural Educator, 27*(3), 1–7. Retrieved from http://eric.ed.gov/?id=EJ783867

*From the abstract: "*Adequate yearly progress (AYP) on No Child Left Behind criteria was examined for a randomly selected sample of districts that qualify for the Rural Education Achievement Program (REAP). The sample involved 10% of districts that were eligible for the Small Rural Schools Achievement (SRSA) program and 10% that were eligible for the Rural and Low-income Schools (RLIS) program. Based on district reports, nearly 80% of SRSA schools made AYP, 11% failed, and 11% did not have adequate data. For schools in the RLIS program, districts reported that 65% made AYP, 29% failed, and 6% did not report adequate data. The SRSA and RLIS samples had different patterns for the categories of students that did not make AYP. Also, SRSA and RLIS districts were differentially distributed across the United States. Implications for interventions are discussed."

Note: See table 3 (page 6) for information about RLIS program schools and SRSA program schools.

Finn, J. D., Gerber, S. B., & Boyd-Zaharias, J. (2005). Small classes in the early grades, academic achievement, and graduating from high school. *Journal of Educational Psychology*, *97*(2), 214–223. Retrieved from http://staging.educationjustice.org/assets/files/pdf/Resources/Policy/Programs%20That%20Work/Small%20class%20sizes%20in%20the%20early%20grades,%20academic%20achievement%20and%20graduating%20from%20high%20school.pdf

From the abstract: "This investigation addressed 3 questions about the long-term effects of early school experiences: (a) Is participation in small classes in the early grades (K–3) related

to high school graduation? (b) Is academic achievement in K–3 related to high school graduation? (c) If class size is related to graduation, is the relationship explained by the effect of participation in small classes on students' academic achievement? The study included 4,948 participants in Tennessee's class-size experiment, Project STAR. Analyses showed that graduating was related to K–3 achievement and that attending small classes for 3 or more years increased the likelihood of graduating from high school, especially among students eligible for free lunch. Policy and research implications are discussed."

Note: See table 3 (page 220) for results that include findings about class size and achievement comparing rural to inner city schools.

Irvin, M. J., Meece, J. L., Byun, S. Y., Farmer, T. W., & Hutchins, B. C. (2011). Relationship of school context to rural youth's educational achievement and aspirations. *Journal of Youth and Adolescence*, *40*(9), 1225–1242. Retrieved from https://www.researchgate.net/publication/51491291_Relationship_of_School_Context_to_Rural_Youth%27s_Educational_Achievement_and_Aspirations

*From the abstract: "*Though the poverty encountered by many rural youth encompasses numerous developmental challenges and substantially increases the chances for educational problems, the school context is central to promoting and constraining their development. Therefore, the purpose of this study was to investigate the relationship of school characteristics and schooling experiences to the educational achievement and aspirations of youth from high-poverty rural communities. Differences in the relationship of school characteristics and schooling experiences to the educational outcomes of students from high- versus low-poverty rural communities were also examined. Participants included 6,247 high school students from 43 low-poverty and 21 high-poverty rural communities. Approximately 51.7% of participants were female and the sample was racially/ethnically diverse (66.4% White, 9.2% African American, 8.1% Hispanic/Latino(a), 4.4% Native American, and 11.8% Multiracial). After controlling for student and family background, school characteristics (e.g., lower student–teacher ratio) were predictive of achievement for rural youth from high-poverty communities. Schooling experiences (e.g., positive perceptions of their ability, a sense of school valuing and belonging, and preparation for postsecondary education) were predictive of educational achievement and aspirations for rural youth from high- and low-poverty communities. Overall, the study highlights unique ways schools can positively shape the educational outcomes for rural youth despite community poverty."

Note: See page 1237 for information about rural school sample class sizes. "…descriptive analyses demonstrated that rural schools in high-poverty communities have higher student–teacher ratios (see Table 1). In addition, other results also have shown that high poverty rural schools have higher student–teacher ratios and are less likely to make adequate yearly progress than small rural schools (Farmer et al. 2006). Though these findings suggest that rural students from high-poverty communities may benefit from smaller classes, rigorous experimental or quasi-experimental studies are needed to provide more definitive tests of causal effects."

Mosteller, F., Light, R. J., & Sachs, J. A. (1996). Sustained inquiry in education: Lessons from skill grouping and class size. *Harvard Educational Review*, *66*(4), 797–843. Retrieved from http://hepg.org/her-home/issues/harvard-educational-review-volume-66-issue-4/herarticle/lessons-from-skill-grouping-and-class-size_247

*From the abstract: "*In this article, Frederick Mosteller, Richard Light and Jason Sachs explore the nature of the empirical evidence that can inform school leaders' key decisions about how to organize students within schools: Should students be placed in heterogeneous classes or tracked classes? What is the impact of class size on student learning? How does it vary? Since tracking (or skill grouping, as the authors prefer to call it) is widely used in U.S. schools, the authors expected to find a wealth of evidence to support the efficacy of the practice. Surprisingly, they found only a handful of well-designed studies exploring the academic benefits of tracking, and of these, the results were equivocal. With regard to class size, the authors describe the Tennessee class size study, using it to illustrate that large, long-term, randomized controlled field trials can be carried out successfully in education. The Tennessee study demonstrates convincingly that student achievement continues when the students move to regular-size classes in the fourth grade and beyond. The authors suggest in conclusion that education would benefit from a commitment to sustained inquiry through well-designed, randomized controlled field trials of education innovations. Such sustained inquiry could provide a source of solid evidence on which educators could base their decisions about how to organize and support student learning in classes and schools."

Note: In this foundational article about the Tennessee Project STAR (Student/Teacher Achievement Ratio), see table 6 (page 817) for demographic information (including the number of rural schools included in the study sample) reviewed by the authors.

Mosteller, F. (1995). The Tennessee study of class size in the early school grades. *The Future of Children, 5*(2), 113–127. Retrieved from http://www.jstor.org/stable/pdf/1602360.pdf?refreqid=excelsior%3A0e0489c9fbbf40e42527cb947a352e44

*From the abstract: "*The Tennessee class size project is a three-phase study designed to determine the effect of smaller class size in the earliest grades on short-term and long-term pupil performance. The first phase of this project, termed Project STAR (for Student-Teacher Achievement Ratio), was begun in 1985, when Lamar Alexander was governor of Tennessee. Governor Alexander, who later served as secretary of education in the cabinet of President George Bush, had made education a top priority for his second term. The legislature and the educational community of Tennessee were mindful of a promising study of the benefits of small class size carried out in nearby Indiana, but were also aware of the costs associated with additional classrooms and teachers. Wishing to obtain data on the effectiveness of reduced class size before committing additional funds, the Tennessee legislature authorized this four-year study in which results obtained in kindergarten, first, second, and third grade classrooms of 13 to 17 pupils were compared with those obtained in classrooms of 22 to 25 pupils and in classrooms of this larger size where the teacher was assisted by a paid aide. Both standardized and curriculum-based tests were used to assess and compare the

performance of some 6,500 pupils in about 330 classrooms at approximately 80 schools in the areas of reading, mathematics, and basic study skills. After four years, it was clear that smaller classes did produce substantial improvement in early learning and cognitive studies and that the effect of small class size on the achievement of minority children was initially about double that observed for majority children, but in later years, it was about the same. The second phase of the project, called the Lasting Benefits Study, was begun in 1989 to determine whether these perceived benefits persisted. Observations made as a part of this phase confirmed that the children who were originally enrolled in smaller classes continued to perform better than their grade-mates (whose school experience had begun in larger classes) when they were returned to regular-sized classes in later grades. Under the third phase, Project Challenge, the 17 economically poorest school districts were given small classes in kindergarten, first, second, and third grades. These districts improved their end-of-year standing in rank among the 139 districts from well below average to above average in reading and mathematics. This article briefly summarizes the Tennessee class size project, a controlled experiment which is one of the most important educational investigations ever carried out and illustrates the kind and magnitude of research needed in the field of education to strengthen schools."

Note: In this foundational article about the Tennessee Project STAR, see table 1 (page 117) that indicates that 38 out of 76 schools (50 percent) in the sample were from rural settings.

Nye, B., Hedges, L. V., & Konstantopoulos, S. (1999). 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. Retrieved from http://www.sesp.northwestern.edu/docs/publications/1915417778452942f9cde5b.pdf

From the abstract: "Reduction of class size to increase academic achievement is a policy option that is currently of great interest. Although the results of small-scale randomized experiments and some interpretations of large-scale econometric studies point to positive effects of small classes, the evidence has been seen by some scholars as ambiguous. Project STAR in Tennessee, a 4-year, large-scale randomized experiment on the effects of class size, provided persuasive evidence that small classes had immediate effects on academic achievement. However, it was not clear whether these effects would persist over time as the children returned to classes of regular size or would fade, as have the effects of most other early education interventions. This article reports analyses of a 5-year follow-up of the students in that experiment. The analyses described here suggest that class size effects persist for at least 5 years and remain large enough to be important for educational policy. Thus, small classes in early grades appear to have lasting benefits."

Note: See page 130 of this foundational article, where the authors document that their statistical models accounted for geographic location, including rural settings. In addition, see table 2 (pages 134–135) and table 4 (pages 138–139) for results by setting and grade level, including rural schools.

Nye, B., Hedges, L. V., & Konstantopoulos, S. (2000). The effects of small classes on academic achievement: The results of the Tennessee class size experiment. *American Educational*

Research Journal, *37*(1), 123–151. Retrieved from http://www.sesp.northwestern.edu/docs/publications/484843233452942ed452c2.pdf

From the abstract: "The effects of class size on academic achievement have been studied for decades. Although the results of small scale randomized experiments and large-scale econometric studies point to positive effects of small classes, some scholars have seen the evidence as ambiguous. This paper reports analyses of a 4-year, large-scale randomized experiment on the effects of class size, project STAR in Tennessee. Although implementation was not perfect, these analyses suggest that shortcomings in implementation probably led to underestimates of the effects of class size. The analyses reported here suggest class size effects that are large enough to be important for educational policy and that are quite consistent across schools. Thus, small classes appear to benefit all kinds of students in all kinds of schools."

Note: This foundational article about the Tennessee Project STAR documents how the authors' statistical model accounts for geographic location (including rural settings) on pages 137–139 and in table 8 (pages 140–142).

Roscigno, V. J., Tomaskovic-Devey, D., & Crowley, M. (2006). Education and the inequalities of place. *Social Forces*, *84*(4), 2121–2145. Retrieved from https://www.researchgate.net/publication/236823381_Education_and_the_Inequalities_of_Place

*From the abstract: "*Students living in inner city and rural areas of the United States exhibit lower educational achievement and a higher likelihood of dropping out of high school than do their suburban counterparts. Educational research and policy has tended to neglect these inequalities or, at best, focus on one type but not the other. In this article, we integrate literatures on spatial stratification and educational outcomes, and offer a framework in which resources influential for achievement/attainment are viewed as embedded within, and varying across, inner city, rural and suburban places. We draw from the National Educational Longitudinal Survey and the Common Core of Data, and employ hierarchical linear and hierarchical logistic modeling techniques to test our arguments. Results reveal inner city and rural disadvantages in both family and school resources. These resource inequalities translate into important educational investments at both family and school levels, and help explain deficits in attainment and standardized achievement. We conclude by discussing the implications of our approach and findings for analyses of educational stratification specifically and spatial patterning of inequality more generally."

Note: This article uses student-teacher ratio as a proxy for class size. See table 4 (page 2134), table 5 (page 2136), and table 6 (page 2137) for results that include findings from rural settings.

Methods

Keywords and Search Strings

The following keywords and search strings were used to search the reference databases and other sources:

- Class size AND rural
- “class size” rural education
- “class size” AND rural
- “class size” AND rural schools
- Impact of class size in a rural setting
- Impact AND class size AND rural
- Rural class size
- Class-size reduction in rural settings
- Student-teacher ratio AND rural

Databases and Resources

We searched ERIC, a free online library of more than 1.6 million citations of education research sponsored by the Institute of Education Sciences (IES), for relevant resources. Additionally, we searched the academic database ProQuest, Google Scholar, and the commercial search engine Google.

Reference Search and Selection Criteria

In reviewing resources, Reference Desk researchers consider—among other things—these four factors:

- Date of the publication: Searches cover the most current information (i.e., within the last ten years), except in the case of nationally known foundational resources.
- Search priorities of reference sources: Search priorities include IES, nationally funded, and certain other vetted sources known for strict attention to research protocols. Applicable resources must be publicly available online and in English.
- Methodology: The following methodological priorities/considerations guide the review and selection of the references: (a) study types—randomized controlled trials, quasi experiments, surveys, descriptive data analyses, literature reviews, policy briefs, etc., generally in this order; (b) target population, samples (representativeness of the target population, sample size, volunteered or randomly selected), study duration, etc.; (c) limitations, generalizability of the findings and conclusions, etc.
- Existing knowledge base: Vetted resources (e.g., peer-reviewed research journals) are the primary focus, but the research base is occasionally slim or nonexistent. In those cases, the best resources available may include, for example, reports, white papers,

guides, reviews in non-peer-reviewed journals, newspaper articles, interviews with content specialists, and organization websites.

Resources included in this document were last accessed on July 14, 2017. URLs, descriptions, and content included here were current at that time.

This memorandum is one in a series of quick-turnaround responses to specific questions posed by education stakeholders in the Appalachia region (Kentucky, Tennessee, Virginia, and West Virginia), which is served by the Regional Educational Laboratory Appalachia (REL AP) at SRI International. This Ask-A-REL response was developed by REL AP under Contract ED-IES-17-C-0004 from the U.S. Department of Education, Institute of Education Sciences, administered by SRI International. The content does not necessarily reflect the views or policies of IES or the U.S. Department of Education, nor does mention of trade names, commercial products, or organizations imply endorsement by the U.S. government.