Reference: Blatchford, P., Bassett, P., Goldstein, H. & Martin, C. (2003). Are class size differences related to pupils' educational progress and classroom processes? Findings from the Institute of Education Class Size Study of children aged 5-7 years. British Educational Research Journal, 29 (5), pp. 709-730.

STRUCTURED ABSTRACT

Background: The Class Size Study conducted by the Institute of Education of the University of London is the most comprehensive analysis of the educational consequences of class size in the early grades ever conducted in the United Kingdom. The study had two primary aims: to evaluate the relationship in the early grades between class size and student academic achievement and between class size and classroom processes.

Purpose: To report the findings of the Institute of Education Class Size Study.

Setting: England.

Population: 11,386 children between the ages of 4 and 7 enrolled in English all-through primary schools (ages 4-11) or infant schools (ages 4-7) in 1996-1998. 17% of participants were eligible for free school meals; 91% were classified as White.

Research Design: Longitudinal, observational cohort study that employed both quantitative and qualitative methods.

Data Collection and Analysis: The Institute of Education (IOE) Class Size Study followed two separate cohorts of students for 3 years each, starting with the "Reception" year (ages 4-5, similar to pre-kindergarten in the U.S.) and continuing through "Year 1" (ages 5-6, similar to kindergarten in the U.S.) and "Year 2" (ages 6-7, similar to Grade 1 in the U.S.). The first cohort consisted of 7142 students in 330 classes in 199 schools who began their Reception year in 1996; the second cohort consisted of 4244 students in 212 classes in 134 schools who began their Reception year in 1997.

Schools enrolled in the Class Size Study were randomly selected from within participating local education authorities. All students entering Reception classes in the selected school were included in the study. Differences in class size occurred naturally and were not experimentally changed in any way.

Student data collected included free school meal eligibility, age, ethnicity, pre-school attendance, English as an additional language, special needs status, and gender. Class size was determined by the school register and by counting the number of children in the classroom at a particular point during the school year. Information was collected on the number of adults present in the class, including teachers, school staff, and other adults. Teachers completed questionnaires to self-report age, education, number of years of teaching experience, length of stay at current school, job stress, and job satisfaction.

Student achievement data were collected in several ways. At the beginning of their school career, each student received the Avon Reception Entry Assessment comprised of teacher ratings, classroom observations, and completion of tasks. At the end of their Reception year, each student took the Literacy Baseline component of the Reading Progress Test and a specially designed mathematics test. At the end of Year 1 students took the Young's Group Reading and Mathematics tests, and the end of Year 2 students took the National Curriculum assessments, as required by the government.

Teachers provided information on the way their classes were subdivided into small groups for instructional purposes by noting the number and size of small groups within their class at a given time during the school day.

At the end of each term, teachers self-reported in questionnaires how teaching time was allocated in their classes among teaching activities in general (and various reading activities in particular) versus classroom management and other non-teaching activities.

Researchers conducted systematic classroom observations of a subsample of 235 students: six students were followed in each of 18 Reception classes with naturally occurring "small" class sizes (fewer than 20 students) and in each of 21 Reception classes with naturally occurring "large" class sizes (more than 29 students). Researchers used 5-minute observation sheets divided into 10-second increments to note how children interacted with teachers and other students in the classroom.

Teachers reported in year-end questionnaires how they thought class size differences affected classroom teaching and learning. Teachers also reported how they thought the presence of other adults in the classroom affected teaching and learning.

Case studies were conducted in a total of 24 classes that were considered "small" (fewer than 20 students), "small medium" (20-25 students), "large medium" (26-29 students), and "large" (over 29 students). The case studies included whole class observation; individual student observations; semi-structured interviews with teachers and head teachers; and the notes and observations of the field researchers, who were themselves experienced teachers.

Teachers completed a Pupil Behavior Rating for each student, consisting of 50 items rated on a 3-point scale pertaining to hyperactivity, aggression, anxiety, pro-social behavior, asocial behavior and exclusion.

In analyzing achievement data, multilevel statistical models were used to control for students' prior achievement; student, class and teacher characteristics; and changes in class size from year to year.

Findings: There was a clear and consistent relationship between class size and academic achievement in the Reception year. Students with low literacy scores before starting their Reception year (i.e., students scoring in the bottom 25% of pre-Reception literacy) experienced the largest academic gains in literacy in the small classes. In this low-achievement group, being in a small class of 20 students had an effect size of 0.35 in end-of-year literacy scores when

compared with being in a class of 30 students – in other words, on average, Reception students who would have scored at the 50th percentile in literacy in the large class scored at the 64th percentile in the small class.

In the middle-achievement group (i.e., students in the middle 50% of pre-Reception year literacy scores), the effect size of being in a small class of 20 students was 0.2 when compared to being in a large class of 30 students in end-of-year literacy attainment - on average, Reception students who would have scored at the 50th percentile in literacy in the large class scored at the 58th percentile in the small class.

In the high-achievement group (i.e., students in the top 25% of pre-Reception year literacy scores), the effect size of being in a small class of 20 students was 0.15 when compared to being in a large class of 30 students in end-of-year literacy attainment. On average, Reception students who would have scored at the 50th percentile in literacy in the large class scored at the 56th percentile in the small class.

In mathematics, being in a small class of 20 students had an effect size of 0.25 in end-of-year math scores when compared with being in a class of 30 students. On average, Reception students who would have scored at the 50th percentile in math in the large class scored at the 60th percentile in the small class. This relationship was found in the Reception year across all three categories of students (i.e., low-achievement, middle-achievement, and high-achievement).

In the longitudinal analysis of achievement data, the academic benefits of being in a small class in the Reception year were maintained for students moved into smaller or similar-sized classes in Year 1, but lost for those students moved into larger classes. Overall, class size differences in Years 1 and 2 were not found to be related to academic progress in literacy or mathematics.

Class size was consistently related to teaching in all three early grades (Reception through Year 2). Small class size was related to more teaching occurring in the classroom overall, while large class size was related to less teaching overall. In the Reception year, on average teachers with a class size of 15 spent 73% of their overall time teaching, whereas teachers with a class size of 24 spent only 65% of their time teaching. During the systematic classroom observations, children in small classes (fewer than 20 students) had 213 interactions with their teachers, compared to 144 interactions for their counterparts in large classes (over 29 students); children in large classes interacted more with each other, with 76 student-to-student interactions observed in the large classes compared to 54 student-to-student interactions in the small classes.

Children in larger classes were more likely to be distracted away from their work, especially when alone and not performing specified assignments. In general, children in large classes were observed to be twice as likely to be off-task.

When teachers subdivided their students into small groups for instructional purposes, class size was related to the number and size of these within-class groups. Large class sizes of over 25 students were positively associated with large group size of 7 to 10 students, which qualitative analyses indicated were less effective academically than the smaller group size of 4 to 6 students.

For all three years (i.e., Reception through Year 2), no relationship was found between having extra adults or staff in the class and student academic achievement.

Conclusions: The Institute of Education Class Size study clearly shows that small class size is associated with students' academic progress in their first year of school. Attending a small class of 20 students in the Reception year had an effect size of .25 in mathematics and effect sizes of between 0.15 and 0.35 in literacy when compared to attending a class of 30 students. This effect is consistent with the findings of Project STAR in Tennessee, the large-scale randomized-controlled field trial of class size in the early grades in the United States that occurred in the 1980s.

The Institute of Education study demonstrates that small class size in the Reception year benefits all students, with low-achieving students realizing the largest academic gains. It also indicates that it is vital to consider the age of the student when evaluating class size effects.

This observational, longitudinal, multi-method study provides insight into how class size can affect classroom processes in ways that influence student achievement. Children in small classes, for example, were found to be more likely to interact one-to-one with their teachers, and more likely as individuals to be the focus of teacher attention. Teachers in small classes were able to perform more teaching by engaging in less procedural talk. Small classes enabled more teacher task time with students, allowed more teacher support for learning, and facilitated classroom management and control. Children in larger classes were more likely to be distracted away from their work, especially when alone and not performing allocated assignments.

The Institute of Education Class Size study is the first large-scale investigation of the relationship between class size and within-class grouping practices.