Guarino, C. M., Hamilton, L. S., Lockwood, J. R., Rathbun, A. H., & Hausken, E. G. (2006). Teacher qualifications, instructional practices, and reading and mathematics gains of kindergartners: Research and development report [Executive summary] (NCES 2006-031). Washington, DC: National Center for Education Statistics.

Executive Summary

There is increasing interest among educators, policymakers, and researchers in understanding the factors that make some teachers more effective than others, particularly in light of the current focus on educational accountability at the local, state, and national levels. Thus far, only a small body of research exists, however, that links specific teacher qualifications to student achievement. The lack of research is due primarily to the scarcity of data that link student test scores to the characteristics of their teachers. Furthermore, although scholars and policymakers agree that children's early school and family experiences are pivotal, relatively little research exists on the effects of teachers on the educational outcomes of young children.

This study fills a gap in the current research base on the relationship among teacher characteristics, instructional practices, and the achievement of young children through an analysis of data from the Early Childhood Longitudinal Study, Kindergarten Class of 1998–99 (ECLS-K). These data were collected by the National Center for Education Statistics (NCES), within the U.S. Department of Education's Institute of Education Sciences, from a nationally representative sample of the nation's 1998–99 kindergarten class. The students were assessed in reading and mathematics in both the fall and the spring of their kindergarten year, and detailed information was gathered from their parents, teachers, and school administrators. In particular, the teachers were surveyed with regard to their background qualifications and the instructional practices they use in the classroom. As a result, ECLS-K data may provide information relevant to the relationships between teacher-reported qualifications and instructional practices and student achievement during the kindergarten year.

Data from ECLS-K were used to estimate the degree to which specific aspects of teacher training—the teaching credential and coursework in pedagogy—and teaching experience were associated with student achievement. In addition, the study identified teacher-reported instructional practices associated with student achievement gains and examined the qualifications of teachers and aspects of teacher training that were related to the use of these practices. Thus, the study addressed the following research questions:

- To what extent are kindergarten teachers' qualifications and instructional practices associated with gains in reading and mathematics of their students over the course of the kindergarten year?
- How are the instructional practices of kindergarten teachers related to their qualifications?

Using two-level hierarchical linear modeling (HLM), the first set of analyses estimated the relationship between student gains in reading and mathematics and teachers' reports of their qualifications and the specific instructional practices they used in their classrooms. The second set of analyses, also using two-level HLM, estimated the relationship between teachers' reports of their use of specific instructional practices and their qualifications. Comparisons in the text were tested for statistical significance to ensure that the differences were larger than might be

expected due to sampling. Only coefficients with a *p* value of .05 or less were identified as being statistically significant.[1]

Spending more time on subject and working within a full-day kindergarten structure were found to be associated with relatively large gains in achievement. Teacher-reported instructional practice measures designed to emphasize reading and writing skills, didactic instruction, phonics, and reading and writing activities were positively associated with reading achievement gains. Instructional emphasis on traditional practices and computation, measurement and advanced topics, advanced numbers and operations, and student-centered instruction were positively associated with mathematics achievement gains. The study provided no evidence of direct relationships between the self-reported qualifications of teachers and student achievement except for employment status. Children whose kindergarten teachers were employed part time made smaller gains in reading than those whose teachers were employed full time.

The analyses conducted in response to the second research question found evidence that certain teacher background variables—particularly the self-reported amount of coursework in methods of teaching reading and mathematics—were positively related to the teacher-reported frequency of various instructional practices that, in turn, were associated with higher student achievement. The completion of coursework in methods of teaching reading was positively associated with the use of phonics instruction, mixed-achievement grouping, student-centered instruction, and reading and writing activities. Coursework in methods of teaching mathematics was positively associated with the use of practices that emphasized numbers and geometry, advanced numbers and operations, traditional practices and computation, student-centered instruction, and mixed-achievement grouping. In addition, kindergarten teaching experience was negatively related to the use of student-centered instruction in reading and positively related to the use of mixed-achievement grouping in mathematics. Teacher certification appeared unrelated to reported instructional practices, with the exception of a positive association with an emphasis on concepts of measurement and advanced topics in mathematics.

Certain caveats should be noted. Since teachers are not randomly assigned to schools and students are not randomly assigned to teachers or schools, the relationships found in this study cannot be interpreted as causal. They are instead to be interpreted as a description of existing relationships that is reflective of the de facto distribution of teachers and children within the education system. Despite these limitations, this study utilizes a full set of control variables that help mitigate selection bias and provide valuable new information regarding the relationships between student achievement, teacher-reported instructional practices, and teacher-reported qualifications for the kindergarten population. The rich data, their nested structure, and the longitudinal nature of the assessments permit analyses that provide new information regarding existing relationships between student achievement, instructional practices, and teacher qualifications for the kindergarten population.

[1]Standard *t* test values were used to determine whether individual regression coefficients were greater than zero.