

Piano Math Keys[®] BUILDING PRE-SCHOOL MATH & SCIENCE SKILLS



Summary of Program Evaluation Report by Barbara M. Burns, Ph.D., Cognitive Development Lab
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Overview of the Piano Math Keys Program

This Evaluation Report describes a year-long pilot program evaluation of Prospect Latin School's Piano Math Keys Program[®] as conducted by Dr. Barbara Burns and two of her doctoral students Ruby C. Harris, M.A., and Danielle D. Brown, M.A., both in the Ph.D. Program at the University of Louisville. As a result of the research study, the program has now become a fully integrated part of the day-to-day preschool and pre-kindergarten curriculum at Prospect Latin School.

The Piano Math Keys[®] curriculum of Prospect Latin School was designed to boost math and science skills in preschoolers through a uniquely designed curriculum of age-appropriate weekly piano and music lessons. In the study, 33 students ages three and four received two 30-minute group piano lessons under Prospect Latin School's Piano Math Key's curriculum. Lessons were held twice each week throughout the nine-month school year at participating NAEYC accredited preschools and included both individual and group piano instructions as well as adult led singing activities. To reinforce learning, parents agreed to facilitate three 20-minute weekly home rehearsals using the Piano Math Key[®] home activity assignments. A comparison group of an additional 33 students were from other NAEYC preschools but did not receive this program.

The premise of the Piano Math Keys[®] was based on longitudinal studies from the University of California Irvine and the University of Wisconsin (Rauscher, 1996). Here, "children discover the joys of music while clever brain neurons connect together via neural bridges to form the types of thought patterns necessary to understand higher cognitive thinking. These connections form, strengthen, and advance each child's spatial intellect -- the ability to form mental images, visualize graphic representations, and recognize relationships of various objects to one another -- each which are the essential building blocks for calculus, physics, and all mathematics."

Evaluation of the Piano Math Keys Program: TEMA Scores

The TEMA (Test of Early Math Abilities) was administered to the piano group and the comparison group. Students were assessed at baseline on the TEMA in fall 2004 and again in spring 2005. Figure 1 shows the percentage of students in each group that scored above the 75th percentile in fall 2004 compared to spring 2005. The 75th percentile can be qualitatively interpreted as "Above Expected Level." The percentage of students scoring at the 75th percentile increased for both the piano (12.1% to 41.4%) and the comparison (21.2% to 32.3%) groups. Moreover, a paired sample t-test showed that this gain was significant for the piano group $t(32) = 3.56, p < .001$ and the comparison group $t(32) = 3.75, p < .001$.

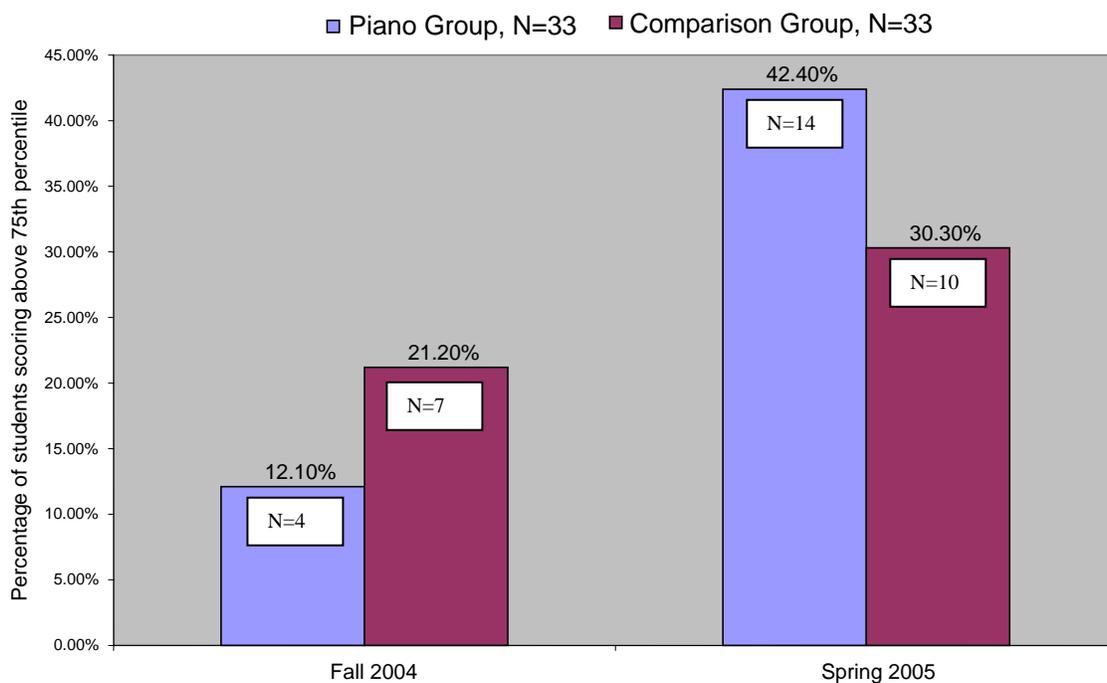


Figure 1. Percent of students scoring above expected percentile on the TEMA