

IMPACT

JULY 2010



Recommended Citation:

Hsu, P. (2010). *KS preschools alumni in the Hawai'i Department of Education: A comparative study of academic achievement, SY 2008–2009*. Honolulu: Kamehameha Schools, Research & Evaluation.



KAMEHAMEHA SCHOOLS

KS Preschools Alumni in the Hawaii Department of Education

A Comparative Study of Academic Achievement, SY 2008–2009

By Pete Hsu

Purpose of the Study

This project aims to examine and analyze the impact of Kamehameha Schools' (KS) preschools on the later academic achievement levels of KS preschool participants. The project tracks KS preschools students who entered the Hawai'i Department of Education (DOE) system and compares their standardized achievement scores with various subsets of DOE students who did not attend a KS preschool. Although KS preschools emphasize the holistic development of their students, with attention given to the cognitive, social, emotional, and physical areas, this study focuses on later academic achievement as an indicator of the cognitive development and academic school readiness of KS preschools alumni.

What We Learned

- The academic performance of Native Hawaiians in the DOE who attended a KS preschool is significantly higher than that of Native Hawaiians who did not attend a KS preschool, although still lower than that of non-Hawaiians in the DOE.
- For both mathematics and reading, the achievement levels of KS preschools alumni are closest to those of non-Hawaiians in the early to mid-elementary grades and generally approach those of other Native Hawaiians with each successive grade.
- The differences in academic performance on the Hawai'i State Assessment (HSA) between KS preschools alumni and the two groups of non-Hawaiians and other Native Hawaiians have remained relatively constant over the past three school years.

Next Steps

- Collaborate with the Hawai'i DOE to access preschool experience data to be able to designate other Native Hawaiians with preschool experience as a comparison group.
- Periodically rerun the analyses as more data become available to track the effects of KS preschools in higher grades and conduct more rigorous trend analyses.
- Examine the nonacademic outcomes of KS preschools alumni, such as student behavior, self-esteem, school engagement, and Hawaiian cultural connectedness.

ESPEEDOMETER

SP1 = Prenatal to 8-years
(Optimize and Build)

SP2 = Grades 4 to 16 and post-high
(Sustain Momentum)

SP3 = Kamehameha Schools Campuses, K to 12
(Innovate and Optimize)

Background

Beginning in school year (SY) 2006–2007, students in the DOE have taken two standardized assessments each spring: the standards-based Hawai'i State Assessment (HSA), which has been used by the state to assess mathematics and reading proficiency levels for the No Child Left Behind policy, and the norm-referenced TerraNova standardized test, which allows for the comparison of Hawai'i DOE students with a national norm group. Currently, the reading and mathematics portions of the HSA are administered to students in Grades 3 through 8 and Grade 10.

For this study, rosters of four-year-old KS preschoolers were available beginning from the class of 2000–2001.¹ Each KS preschool student who entered the DOE system in subsequent years was matched with his or her DOE identification number based on the student's first, middle, and last name; date of birth; and gender. DOE identification numbers were identified in the SY 2006–2007 through SY 2008–2009 HSA datasets. The standardized assessment outcomes of KS preschools alumni were then compared with those of Native Hawaiians who did not attend a KS preschool and with all non-Hawaiians (Table 1).²

Findings

This study focuses primarily on the 2008–2009 school year, the most recent year for which HSA data were available.³ Three descriptive statistics for both mathematics and reading are incorporated in the analysis: (1) average HSA scaled score, (2) percentage of students meeting proficiency on the HSA, and (3) average TerraNova normal curve equivalent (NCE) score. The study also includes a brief examination of the recent trends of elementary school students achieving proficiency on the HSA.



1 Only four-year-old students are included in the study since the vast majority of three-year-olds continue with KS, and a large number of new students enter at age four.

2 Although the DOE collects records of entering kindergartners' preschool experience, these data were not available for the study, preventing comparison of KS preschools alumni to more specific peer categories. It should also be noted that the DOE may underreport the number of Native Hawaiians, due to the historical practice of recording primary ethnicities only.

3 It is important to note that this is not a longitudinal study tracking one cohort advancing through several grades; rather, it is a cross-sectional study comparing several cohorts in successive grades in the same school year.

Table 1. Number of DOE students with valid standardized assessment scores (selected groups, by grade level, SY2008–2009)

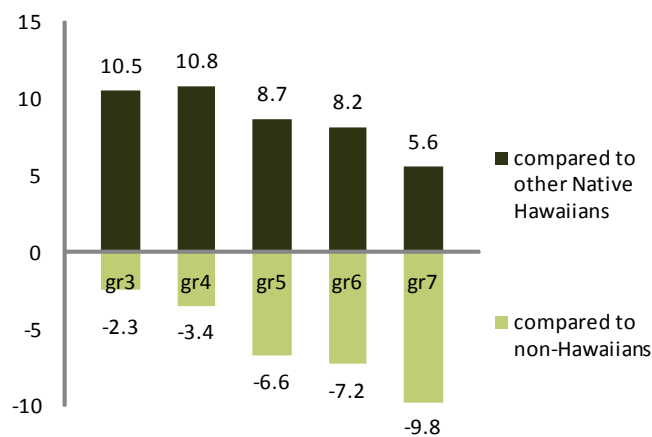
	KS Preschools Alumni	Other Native Hawaiians	Non-Hawaiians
Grade 3	674	3,278	9,919
Grade 4	697	3,208	9,465
Grade 5	621	3,219	9,618
Grade 6	617	2,979	9,383
Grade 7	541	3,140	9,324

Note. Not every student in the dataset had valid data for all of the assessment scores examined in the study. The study does not include higher grades since the KS preschool class of 2000–2001, the earliest cohort of KS preschools alumni for which data were available, was enrolled in Grade 7 in school year 2008–2009.

HSA Scaled Scores

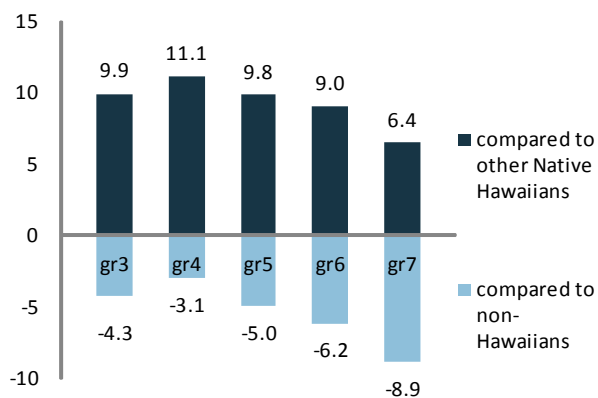
Figures 1 and 2 depict the differences in average scaled scores on the HSA mathematics and reading assessments between KS preschools alumni and the comparison groups of other Native Hawaiians and non-Hawaiians. For both mathematics and reading assessments, KS preschools alumni scored closer to non-Hawaiians than to other Native Hawaiians in the early elementary grades but exhibited a steady gravitation toward other Native Hawaiians as they approached middle school.

Figure 1. KS preschools alumni differences in average mathematics scaled scores (HSA, by grade level [gr], SY2008–2009)



Within both subjects, the only grade level for which the average scaled score of KS preschools alumni was not statistically significantly different from those of both other student groups was Grade 3 in mathematics, when tested against non-Hawaiians.

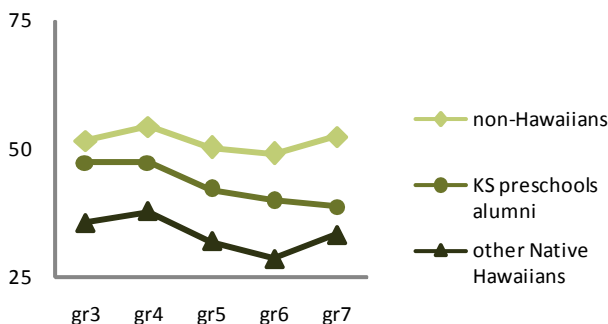
Figure 2. KS preschools alumni differences in average reading scaled scores (HSA, by grade level [gr], SY 2008–2009)



HSA Proficiency Levels

A comparison of the percentages of KS preschools alumni, other Native Hawaiians, and non-Hawaiians meeting or exceeding mathematics and reading proficiency reveals a similar pattern to that of the scaled scores differences (Figures 3 and 4). The percentages of other Native Hawaiians and non-Hawaiians attaining proficiency in mathematics followed a similar trend of slight decline in Grades 4 through 6 and increase in Grade 7. The average percentages of students meeting or exceeding proficiency across all grades were 33.5% for other Native Hawaiians and 51.5% for non-Hawaiians. In comparison, the percentages of KS preschools alumni achieving proficiency in mathematics followed a somewhat linear decline through Grade 7, from 47.4% in Grade 3 to 38.7% in Grade 7.

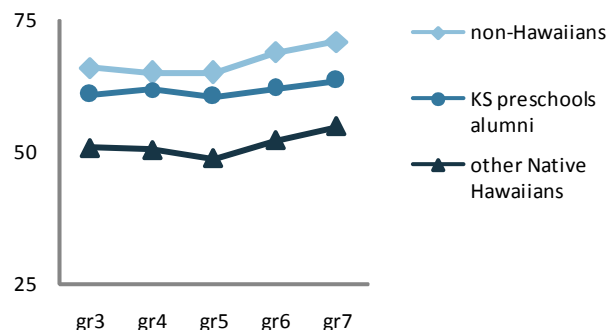
Figure 3. Percentage of students with mathematics scores meeting or exceeding proficiency (HSA, by grade level [gr], SY 2008–2009)



In reading, KS preschools alumni maintained a relatively consistent percentage of students achieving proficiency across the different grade levels, with an average of 61.8%. The differences in percentages proficient between KS preschools alumni and non-Hawaiians initially decreased, with the smallest gap (3.2 percentage points) in Grade 4, but later increased through Grade 7. In Grade 5, 60.6% of KS preschools alumni achieved proficiency, compared with 48.8% of other Native Hawaiians and 65.1% of non-Hawaiians. After Grade 5, all three groups increased in percentages proficient, with KS preschools alumni

having the smallest increase to 63.5% achieving proficiency and other Native Hawaiians seeing the greatest increase to 54.8% of students meeting or exceeding proficiency.

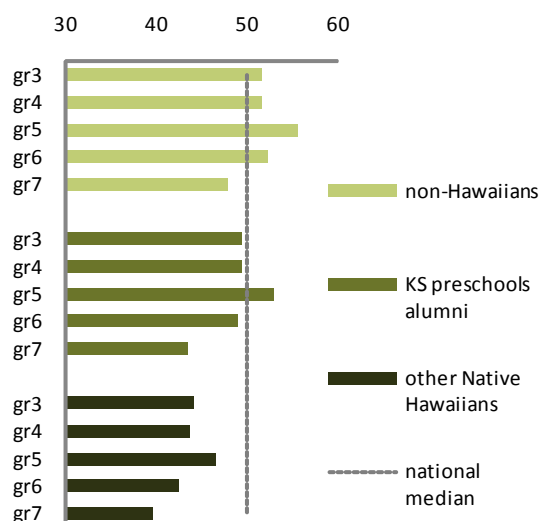
Figure 4. Percentage of students with reading scores meeting or exceeding proficiency (HSA, by grade level [gr], SY 2008–2009)



TerraNova NCE Scores

Analysis of the TerraNova NCE scores reveals KS preschools alumni have performed at levels between other Native Hawaiians and non-Hawaiians, consistent with their HSA outcomes (Figures 5 and 6).⁴

Figure 5. Average mathematics NCE scores [TerraNova, by grade level [gr], SY2008–2009]



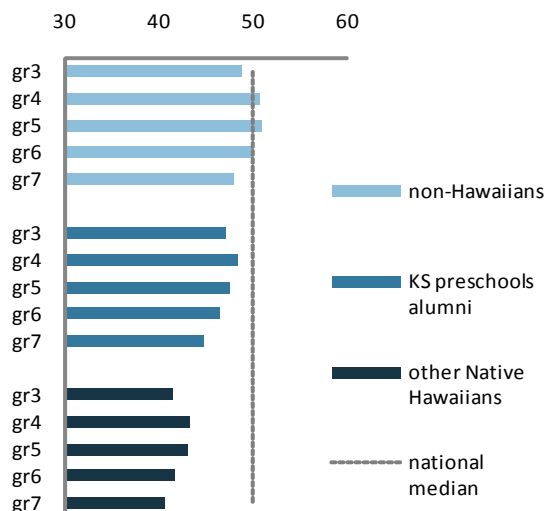
All three student groups displayed similar patterns of scoring for both subjects across the grades examined. Mathematics scores peaked in Grade 5, with average scores of 53.0, 46.7, and 55.7 for KS preschools alumni, other Native Hawaiians, and non-Hawaiians, respectively. Peak reading scores for KS preschools alumni and other Native Hawaiians, respectively, were 48.4 and

⁴ Since individual percentile ranks cannot be aggregated or averaged, each student's national percentile ranks in mathematics and reading were converted to normal curve equivalents (NCEs), which can be averaged, using a statistical transformation method.

42.2 in Grade 4. The peak reading score for non-Hawaiians was 51.0 in Grade 5.

The three student groups scored lower on the TerraNova in reading than in mathematics when compared with the national norm group, although all three groups achieved proficiency at higher percentages for reading than for mathematics on the HSA.

Figure 6. Average reading NCE scores (TerraNova, by grade level [gr], SY 2008–2009)



Recent Trends

Figures 7 and 8 display the aggregated percentages of elementary students achieving proficiency since 2007, when the most recent version of the HSA was first used. The relative achievement of KS preschools alumni and the comparison groups of other Native Hawaiians and non-Hawaiians were consistent for all three years in both subjects. The three-year aggregated percentages of elementary students meeting proficiency in mathematics were 45.4% for KS preschools alumni, 34.5% for other Native Hawaiians, and 51.2% for non-Hawaiians. For reading, the three-year aggregated percentages of elementary students meeting proficiency were 59.7% for KS preschools alumni, 47.8% for other Native Hawaiians, and 63.8% for non-Hawaiians.



Figure 7. Percentage trends of elementary school students with mathematics scores meeting or exceeding proficiency (HSA, Grades 3–5 aggregated, by school year)

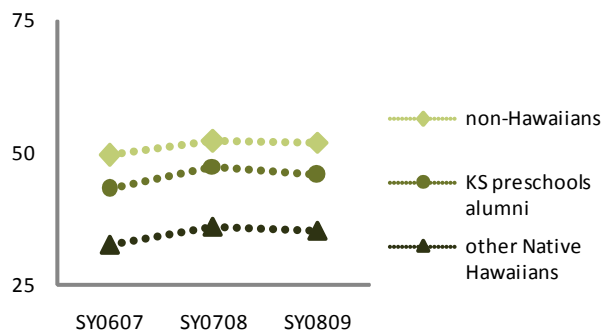
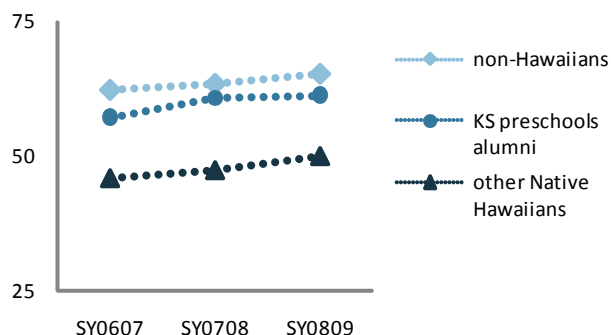


Figure 8. Percentage trends of elementary school students with reading scores meeting or exceeding proficiency [HSA, grades 3–5 aggregated, by school year]



Conclusion

Although KS preschool students are randomly selected from all who apply, they clearly outperform their Native Hawaiian public school peers on tests of academic achievement through Grade 7. While a performance gap, as measured by the standardized HSA and TerraNova, remains between non-Hawaiians and Native Hawaiians in the DOE, the experience of attending a KS preschool appears to be beneficial for a Native Hawaiian child’s academic achievement, despite the fact that the magnitude of the effect diminishes as children move further away from preschool.

While the data available are not sufficient to make strong statements of cause and effect, additional studies examining Native Hawaiians who attended non-KS preschools will provide more insights into the comprehensive impact of the KS preschool experience.



KAMEHAMEHA SCHOOLS