

**The Skillman Foundation's Initiative:
Good Schools Making the Grade**

**Evaluation of the Relationship between
Student Mobility and Academic Achievement
at Skillman Recognized Elementary Schools
2005-2007**

Sharif M. Shakrani
Professor of Measurement and Quantitative Methods, and
Co-Director of the Education Policy Center at MSU

November 4, 2008

Introduction

The purpose of this study is to analyze the impact of student stability and mobility on academic achievement at the 5th grade level. The study analyzes the academic performance of elementary schools in Detroit that were the recipients of recognition and awards as part of The Skillman Foundation initiative entitled *Good Schools: Making the Grade*. Nine elementary schools have been recognized for their high academic performance and 15 for making significant improvement in their academic performance.

The past 5 years have seen a shift in the student population of Detroit, with many more students moving to charter schools and some moving to neighboring school districts. The Detroit Public Schools system enrollment dropped from 153,034 in 2003 to less than 100,000 in 2008. The number of Detroit students who attend charter schools or schools in neighboring districts increased from 40,459 in 2003 to 58,100 in 2008. Given these numbers, it is not surprising that the mobility rate in Detroit is estimated to be about 64% at the elementary school level. This rate is very high even when compared to other large urban areas in the U.S. For example, the average mobility rate for Chicago elementary schools is estimated to be 52%.¹

Student stability in this study is represented by the number of students who remain in a school until the first enrollment count of the next school year as a percent of the total enrollment count in September. Stability rates are a more effective measure of achievement than mobility rates because of the relatively large number of 4th grade students who return to the same school for their 5th grade schooling, especially among schools with high academic achievement levels.

¹ Azcoitia, C. & Kerbow, D. (2003). Student mobility and local school improvement in Chicago. *The Journal of Negro Education*. 72(1), 158.

Student's Mobility and Academic Achievement

The negative impact of student mobility on school success is most likely to be visible at elementary schools with high rates of transfers. Additionally, schools are more likely to experience negative effects if they are serving students from poor families and those who are already academically disadvantaged.² While some research on mobility and achievement has focused on the effects of mobility on students, there are reasons why we should also be looking at schools as the unit of analysis in such investigations. The importance of a stable student population for successful implementation of school reform emerges when considering factors influencing successful curriculum and instructional innovations. For example, high student turnover undermines the capacity of teachers and schools to establish the kinds of home-to-school relations that foster support, cooperation and confidence. In Detroit, low performing schools with high mobility rates spend most of the first month of school preparing students for the MEAP assessment and on remediation efforts for content taught the year before. This creates a situation in which low performing schools have only 8 of the 9 months of the school year to teach the content for that grade, while high performing school have all 9 months to teach the same content. This means that academically disadvantaged students have less time to learn the same scope and sequence than high performing students.

Studies conducted between 1990 and 2004 found that elementary students who are frequent movers (three or more times) are much more likely than their more stable counterparts to have poor academic performance. During primary grades, school mobility significantly lowered reading and mathematics achievement, even after controlling for

² Audette, R. (1998). Mobility in elementary schools, science and social science achievement. *Journal of Social Studies Research*.

prior achievement and other socioeconomic factors.³ Other studies contend that poor school academic performance and mobility have a spurious relationship and are really both a product of a student's home economic status. The same studies find that after controlling for economic status, race, sex and family structure, mobility continue to have a statistically significant relationship to academic achievement. The data from this study show that negative effects of student mobility in Detroit schools, studied at the 5th grade level, are stronger in mathematics than in English language arts. Science results were not as consistent.

Several factors may contribute to mobility's impact on mathematics achievement. Students who transfer between schools may actually miss exposure to key concepts that are prerequisites for higher order skills often tested on MEAP. This lack of exposure may not be crucial at lower grade levels. Its consequence may be delayed as the student moves across grades and is required to build on previous knowledge. Such a scenario may be especially pertinent to mathematics learning, given the Michigan standards that form the basis for the MEAP testing program.

Method

Starting in the school year 2005-06, the Michigan Educational Assessment Program (MEAP) testing period was moved from the end of the school year to the beginning of the school year, usually the last week of September and the first week of October. The fall 2005 MEAP assessment at the 5th grade level measured student knowledge and skills in

³ Kerbow, D. (2002). *School mobility, urban poverty, and school academic growth*. Center for School Improvement. Chicago, IL: University of Chicago.

mathematics, science and English language arts (reading and writing), testing the content that students learned the year before (4th grade).

The change in the MEAP testing dates created a problem for this study. In the previous study for mobility rates, mobility was computed by taking the ratio of students who were in a school at the beginning of the school year but not at the end of the school year plus students who moved into the school during the school year and were still there at the end of the year, divided by the average enrollment for the school year. This definition will not be helpful in measuring the impact of mobility on academic achievement because the MEAP data will not include those students who moved into that school after the MEAP testing period. Therefore, for this study, it was necessary to identify the stable student population as those who were enrolled in the same school the year before and were included in the September enrollment count when these students were in the 4th grade. As a result, this study examines the academic achievement of the stable students who were in the same school the year before and compares this data to the total class results that included the new students who moved into the school at the end of the summer and excludes the students who moved out of the school prior to the MEAP testing period.

The proportion of students who met or exceeded the state proficiency standards (students at levels 1 and 2) is the data used for the comparisons. This is the category that the state uses in calculating the Adequate Yearly Progress (AYP) criterion of the federal No Child Left Behind Act of 2001 (NCLB).

It must be noted that MEAP achievement data were not available for the two non-public schools, Cornerstone and Christ the King, as these schools did not opt to

participate in the MEAP assessment and the standardized norm-referenced tests they use are not comparable to MEAP. Also, this study did not have access to the enrollment data for 4th and 5th grade students in these two schools. Note, too, that in 2006 Yost Academy was closed and its students were enrolled in neighboring schools. In 2007, Genesis Elementary School was also closed, so data for that school was available for 2005 and 2006 assessment cycles only.

This study analyzes the academic achievement of stable students over the past three MEAP assessment cycles 2005, 2006 and 2007 in the areas of mathematics, science and English language arts. These are the three areas that form the basis for determining qualifications for The Skillman Foundation’s recognition program “Good Schools Making the Grade.”

The proportion of students who met the state proficient standard by subject area for each year and each school are shown on tables 1, 2 and 3.

Data Analysis

The primary analysis in this study involved the calculation of the percent of stable 5th grade students who met or exceeded the state proficiency standards in mathematics, science, and English language arts at each of the High Performing and Improving schools recognized and awarded by The Skillman Foundation in 2005. These data were then compared to the percentage of all students who met the proficiency standards at that grade. Thus, the number of stable students is a subset of the total number of students. The difference in number between stable and total number of students are the mobile students

who moved into that school during the first month of the 2005-06 school year but were not in that school during the 2004-05 school year.

The weighted mean percent of proficient students was computer for the High Performing and Improving schools for each of the three years studied. The standard deviation and the standard errors were computed for each comparison group by subject area and for each of the three years studied.

The 95% confidence interval was chosen as the criteria to test if the stable student percentages differ significantly from those for all students. In other words, we wanted to be able to conclude with 95% confidence that the differences between the tabulated average achievement of the stable and all students involved are significant and are not due to chance fluctuation or random error.

The 95% confidence interval is tested using the following formula to determine the upper and lower limits of the interval:

$$95\% \text{ Confidence Interval (CI)} = X_i \pm 1.96 (\text{S.E.})$$

Where X_i is the weighted average (mean) percent of students meeting the proficient level and S.E. is the standard error of the mean, which is obtained by the following formula:

$$\text{S.E.} = \frac{\text{S.D.}}{\sqrt{N-1}}$$

Where S.D. is the standard deviation of the percent of students who are proficient and N is the number of students tested.

Results

Analysis of student stability and achievement produced different results for High Performing schools and Improving schools. In school years 2005-06 and 2006-07, High

Performing schools' overall student achievement was not significantly different from the stable student achievement in mathematics, science and English language arts. This is not surprising since the grade 4 to grade 5 stability rates in these High Performing elementary schools was about 80% compared to 72% for the Improving schools and about 65% for all 130 elementary schools in the district.

Tables 2 and 4 show the statistical analysis for the results of High Performing schools in each subject area tested. These schools have had very high proportions of stable students in 2005 and 2006. The results indicate no discernable differences between all students and stable students in 2005 and 2006. However, in 2007 the results were significantly different. This may be due to the closure of many schools in Detroit and the influx of the higher than usual number of students into these schools in 2007.

Tables 3 and 5 show the statistical analysis for the Improving schools in each subject area tested. These schools had varying degrees of stability among their 5th grade population. Some schools, like Crary, Dixon, and McKenny elementary schools, have significantly lower stability rates than schools such as Foreign Language Immersion, Carstens, and YMCA Service Learning Academy. In mathematics, stable students in these schools showed significantly higher achievement percentages than all students in the three years studied. In English language arts and science the results were not as conclusive. However, data from the 2007 assessment showed statistically significant differences between stable and all students in all three subject areas, which is consistent with the results for the High Performing schools. This may be attributed to the higher mobility rates for most of the Improving schools in 2007.

Overall, the results indicate that stable students in Improving schools tend to achieve academically at high levels than the mobile students who transferred to that school at the beginning of the year.

Mobility and Achievement at High Performing Elementary Schools in Detroit

It is clear from this study that not all mobility has the same impact on achievement. Students who change schools by entering a high performing school experienced fewer negative consequences than students who transfer into other schools that are not high performing or almost high performing. In fact, the data for elementary schools recognized by The Skillman Foundation as high performing show no significant differences overall between stable students and new entrants. The only exception to this pattern is seen in the 2007 assessment results for Holcomb Elementary School (Table 2), which showed a significant drop in the proportion of 5th grade students meeting the state proficiency standards in mathematics, science and English language arts. However, stable students who attended Holcomb the year before as 4th graders achieved significantly higher than the school average in mathematics and science. This school had a relatively high mobility rate during the 2007-08 school year and received a large number of new students from schools that were closed the year before. Overall, High Performing schools in Detroit do not seem to be affected by large mobility rates. In fact, test data show that mobile students seem to perform as well as stable students.

It is possible that most elementary school children in Detroit who transferred into the High Performing schools were high achieving students to start with and that their parents wanted them in an academic atmosphere commensurate with their abilities. It is

also possible that the stable students influence the new students in terms of study habits and effective school behaviors.

Mobility and Achievement at Improving Elementary Schools in Detroit

The impact of higher mobility rates at the Improving schools on achievement is more related to the subject area tested (Table 5). In mathematics, there were significant differences in the number of stable students versus all students who reached the proficient achievement level. This means that the mobile students' achievement on the MEAP mathematics test was significantly lower than the stable students in all three years studied. In science, the differences were significant in 2005 and 2007 but not in 2006 MEAP assessments. In English language arts, only the 2007 data showed significant differences in achievement between stable student scores and all scores. Individual analysis of Improving schools (Table 3) show schools with a higher percentage of students reaching the proficient level. Carstens, Foreign Language Immersion and YMCA Service Learning Academy were less impacted by student mobility, and the achievement of the stable students was not different from total student achievement. However, schools with low student achievement were significantly impacted by the large mobility rates in schools such as Crary, Mark Twain, McKenny and Wilkins. In these schools, the total student achievement (stable plus mobile students) was significantly lower than the stable students. Mathematics achievement seems to be the most problematic in schools with high mobility rates.

Summary and Conclusion

Overall, the results are consistent for all subjects and all schools in the 2007 assessment cycle. The stable students performed better than mobile students in the High Performing and Improving elementary schools studied. The serious negative economic and housing mortgage situation in Detroit coupled with declining enrollment at the district schools may have contributed to the increased mobility rates and the overall decline in student achievement. Low achieving schools are well-advised to provide summer or after school remedial training in mathematics to new students in Detroit who scored below the proficient level on their 4th grade MEAP testing. Similar opportunities should be provided to students whose reading skills are at the basic or below basic levels.

Although much of the student mobility between schools is associated with changes of residence, a significant proportion of moves are related to student and family dissatisfaction with the previous school's academic and administrative factors. The amount of effort parents, the community and the schools are willing to make to keep the students in the same school is closely connected to the quality of school, academic performance and social ties parents have with the school. Drawing families, particularly those new to the school, into open and personal relationships create an incentive for a family to remain at that school and to resolve conflicts that may arise.

Table 1
Good Schools: Making the Grade Evaluation Study
Achievement Data for High Performing and Improving Elementary Schools

Per	School	5th Grade Total Enroll	5th Grade Stable Enroll	Type	Grants	04-05 N Count Total MEAP ELA	04-05 N Count S.E. MEAP ELA	5th Gr. Fall 2005 Math	5th Gr. Fall 2006 Math	5th Gr. Fall 2007 Math	5th Gr. Fall 2005 Sci	5th Gr. Fall 2006 Sci	5th Gr. Fall 2007 Sci	5th Gr. Fall 2005 ELA	5th Gr. Fall 2006 ELA	5th Gr. Fall 2007 ELA
H	Bates (K-8)	107	96	D	100,000	107	0	98.1	88.9	96.8	98.2	98.0	94.7	98.1	99.0	94.7
H	Burton International (K-8)	63	56	D	75,000	63	1	90.3	86.4	75.7	85.7	86.4	97.1	68.3	98.3	88.6
H	Chrysler (K-5)	25	20	D	50,000	25	0	96.0	92.6	86.4	100.0	100.0	90.9	100.0	100.0	95.5
H	Cornerstone (K-8)	NDA	NDA	P	100,000	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA
H	Davison (K-6)	115	78	D	75,000	115	5	73.9	47.6	46.2	85.0	77.5	55.6	64.3	65.3	46.2
H	Gompers (K-5)	36	29	D	100,000	36	2	50.0	94.7	95.0	63.9	94.4	80.0	55.6	75.0	45.0
H	Holcomb (K-5)	67	51	D	100,000	67	10	59.7	76.6	51.9	71.2	79.6	38.5	77.6	75.6	65.4
H	Nataki Talibah (K-8)	43	34	C	100,000	43	1	41.9	56.3	50.0	44.2	83.3	81.8	51.2	60.4	77.3
H	Newberry (K-5) <i>closed 05</i>	NDA	NDA	D	50,000	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA
I	Acad of the Americas (K-8)	85	58	D	25,000	85	5	54.1	49.3	37.7	55.3	62.0	55.1	55.3	52.9	39.7
I	Burns (K-6)	74	50	D	50,000	74	6	77.3	66.7	56.3	66.7	74.7	41.4	47.3	56.0	25.6
I	Carstens (K-5)	59	43	D	25,000	59	7	79.7	77.8	91.4	55.9	73.0	77.6	86.4	75.0	75.9
I	Christ the King (K-8)	NDA	NDA	P	50,000	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA
I	Crary (K-5)	54	38	D	50,000	54	2	41.1	59.6	15.0	41.8	54.7	53.7	53.7	57.7	60.0
I	Dixon Elem/Middle (K-8)	81	55	D	50,000	81	1	34.1	30.5	54.1	70.7	59.3	61.3	60.5	55.9	61.3
I	Foreign Lang Immer (K-8)	36	29	D	50,000	36	0	86.1	61.0	63.0	94.4	60.3	81.5	94.4	61.8	64.8
I	Genesis (K-6) <i>closed 07</i>	43	31	D	15,000	43	0	38.6	79.5	NDA	84.1	93.2	NDA	69.8	36.4	NDA
I	John R. King (K-6)	66	39	D	50,000	66	5	55.2	53.1	43.4	95.5	100.0	76.2	71.2	73.0	65.1
I	Mark Twain Elem (K-8)	35	21	D	15,000	35	5	29.4	25.9	26.1	37.1	66.7	47.8	25.7	59.3	34.8
I	McKenny (K-6)	62	45	D	15,000	62	6	18.0	20.0	18.6	45.9	59.0	34.9	48.4	33.9	29.5
I	Wayne (K-5)	80	54	D	15,000	80	5	72.5	72.4	32.6	90.0	53.4	45.7	73.8	67.2	42.4
I	Wilkins (K-6)	99	68	D	25,000	99	3	15.2	31.0	36.6	29.0	43.7	53.5	47.5	42.0	54.3
I	YMCA Serv Learn Acad (K-8)	124	99	C	50,000	124	1	63.7	80.7	77.8	52.8	75.2	88.0	62.9	78.2	78.8
I	Yost Academy (K-5) <i>closed 06</i>	29	20	D	10,000	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA

D: Detroit Public Schools, C: Charter Schools, P: Private or Religious Schools, NDA: No Data Available

Table 2
Good Schools: Making the Grade Evaluation Study
High Performing Elementary Schools in Detroit for 5th Grade

School	N Count Total Student 05	N Count Stable Student 05	Math Total Student % MEAP			Math Stable Student % MEAP			Sci Total Student % MEAP			Sci Stable Student % MEAP			ELA Total Student % MEAP			ELA Stable Student % MEAP		
			Levels 1 & 2			Levels 1 & 2			Levels 1 & 2			Levels 1 & 2			Levels 1 & 2			Levels 1 & 2		
			05	06	07	05	06	07	05	06	07	05	06	07	05	06	07	05	06	07
Bates (K-8)	107	96	98	89	97	98	90	97	98	98	95	98	98	96	98	99	95	98	98	94
Burton International (K-8)	63	56	90	86	76	90	88	81	86	86	97	87	86	95	68	98	89	74	97	90
Chrysler (K-5)	25	20	96	93	86	95	94	88	100	100	91	100	100	95	100	100	96	100	100	100
Davison (K-6)	115	78	74	48	46	80	56	51	85	78	56	85	78	62	64	65	46	70	64	55
Gompers (K-5)	36	29	50	95	95	41	44	95	64	94	80	68	90	89	56	75	45	69	69	52
Holcomb (K-5)	67	51	60	77	52	65	78	68	71	80	39	88	84	66	78	76	65	80	80	74
Nataki Talibah (K-8)	43	34	42	56	50	47	56	59	44	83	82	52	80	80	51	60	77	53	65	88
Detroit Public Schools	9200	6205	45	47	44				49	59	56				54	56	51			
State of MI Public Schools	120570		73	76	74				77	83	82				75	78	78			

Table 3
Good Schools: Making the Grade Evaluation Study
Improving Elementary Schools in Detroit for 5th Grade

School	N Count Total Student 05	N Count Stable Student 05	Math Total Student % MEAP			Math Stable Student % MEAP			Sci Total Student % MEAP			Sci Stable Student % MEAP			ELA Total Student % MEAP			ELA Stable Student % MEAP		
			Levels 1 & 2			Levels 1 & 2			Levels 1 & 2			Levels 1 & 2			Levels 1 & 2			Levels 1 & 2		
			05	06	07	05	06	07	05	06	07	05	06	07	05	06	07	05	06	07
Acad of the Americas (K-8)	85	58	54	49	38	61	52	56	55	62	55	62	58	66	55	53	40	55	53	55
Burns (K-6)	74	50	77	67	56	80	70	62	67	75	41	70	82	58	47	56	26	50	62	48
Carstens (K-5)	59	43	80	78	91	84	81	95	56	73	78	62	81	81	86	75	76	86	81	81
Crary (K-5)	54	38	41	60	15	42	62	18	42	55	54	42	54	54	54	58	60	60	62	68
Dixon Elem/Middle (K-8)	81	55	34	31	54	40	42	56	71	59	61	74	62	66	61	56	61	63	58	60
Foreign Lang Immer (K-8)	36	29	86	61	63	86	72	70	94	60	82	96	73	89	94	62	65	96	73	69
Genesis (K-6)*	43	31	39	80		42	78		84	93		90	96		70	36		76	42	
John R. King (K-6)	66	39	55	53	43	60	60	51	96	100	76	100	100	79	71	73	65	79	74	74
Mark Twain Elem (K-8)	35	21	29	26	26	38	33	29	37	67	48	43	71	57	26	59	35	29	62	43
McKenny (K-6)	62	45	18	20	19	20	24	21	46	59	35	52	66	42	48	34	30	52	34	34
Wayne (K-5)	80	54	73	72	33	75	75	55	90	53	46	88	56	50	74	67	42	72	70	54
Wilkins (K-6)	99	68	15	31	37	18	34	30	29	44	54	32	46	44	48	42	54	52	40	42
YMCA Serv Learn Acad (K-8)	124	99	64	81	78	68	86	81	53	75	88	59	78	93	63	78	79	64	80	96
Detroit Public Schools	9200	6205	45	47	44				49	59	56				54	56	51			
State of MI Public Schools	120570		73	76	74				77	83	82				75	78	78			

*Closed in 07

Table 4
Good Schools: Making the Grade Evaluation Study
High Performing School (N=7)

Mathematics

Year	All Students			Stable Students			Significance Test	
	Weighted Mean(%)	Weighted S.D.	Weighted S.E.	Weighted Mean(%)	Weighted S.D.	Weighted S.E.	Difference Stable-All	Significant
2005	76	19.20	0.90	79	19.16	1.00	3	No
2006	74	18.25	0.85	74	17.01	0.91	0	No
2007	69	21.60	1.01	76	18.23	0.98	7	Yes

Science

Year	All Students			Stable Students			Significance Test	
	Weighted Mean(%)	Weighted S.D.	Weighted S.E.	Weighted Mean(%)	Weighted S.D.	Weighted S.E.	Difference All-Stable	Significant
2005	81	16.17	0.76	84	13.56	0.71	3	No
2006	87	8.62	0.40	88	8.06	0.42	1	No
2007	74	21.68	1.02	82	14.61	0.77	8	Yes

ELA

Year	All Students			Stable Students			Significance Test	
	Weighted Mean(%)	Weighted S.D.	Weighted S.E.	Weighted Mean(%)	Weighted S.D.	Weighted S.E.	Difference All-Stable	Significant
2005	75	16.71	0.78	78	14.57	0.76	3	No
2006	81	15.71	0.74	83	15.18	0.80	2	No
2007	72	20.61	0.96	79	17.19	0.90	7	Yes

Weight Mean = Average weighted percent of students reaching the proficient level on MEAP.

Table 5
Good Schools: Making the Grade Evaluation Study
Improving Schools (N=13)

Mathematics

Year	All Students			Stable Students			Significance Test	
	Weighted Mean(%)	Weighted S.D.	Weighted S.E.	Weighted Mean(%)	Weighted S.D.	Weighted S.E.	Difference All-Stable	Significant
2005	51	22.37	0.75	55	22.38	0.89	4	Yes
2006	55	20.83	0.70	61	20.27	0.81	6	Yes
2007	48	21.88	0.75	55	22.47	0.92	7	Yes

Science

Year	All Students			Stable Students			Significance Test	
	Weighted Mean(%)	Weighted S.D.	Weighted S.E.	Weighted Mean(%)	Weighted S.D.	Weighted S.E.	Difference All-Stable	Significant
2005	61	20.77	0.69	65	19.76	0.79	4	Yes
2006	65	15.12	0.55	67	15.28	0.66	2	No
2007	61	16.90	0.58	66	17.67	0.72	5	Yes

ELA

Year	All Students			Stable Students			Significance Test	
	Weighted Mean(%)	Weighted S.D.	Weighted S.E.	Weighted Mean(%)	Weighted S.D.	Weighted S.E.	Difference All-Stable	Significant
2005	61	14.67	0.58	64	14.06	0.59	3	No
2006	59	13.91	0.53	62	15.25	0.66	3	No
2007	54	17.41	0.71	63	19.37	0.79	9	Yes

Weight Mean = Average weighted percent of students reaching the proficient level on MEAP.