

The Relationship Between Years Spent in MMSD and WKCE Performance

MAJOR FINDINGS

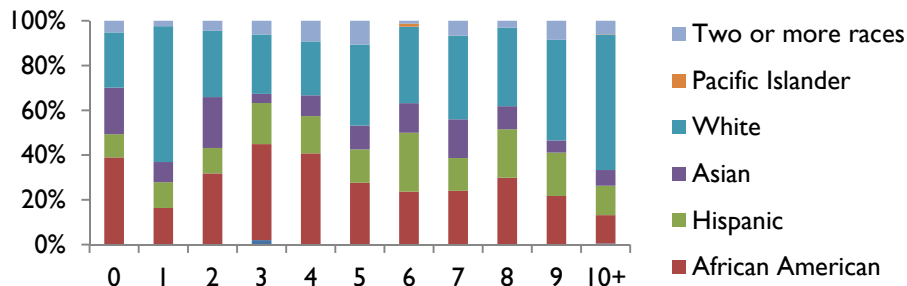
1. Students who have spent more time in MMSD perform better on the WKCE than their peers who have spent less time in MMSD.
2. Students who have spent more time in MMSD are demographically different from recent arrivals, who are less likely to be white and more likely to be low-income.
3. When controlling for demographic characteristics, the effects of additional years in MMSD on WKCE scores are largely ambiguous.

Based on these findings, MMSD may be better served by refining its core curriculum to meet students' needs based on demographic characteristics rather than the recency of their arrival in MMSD.

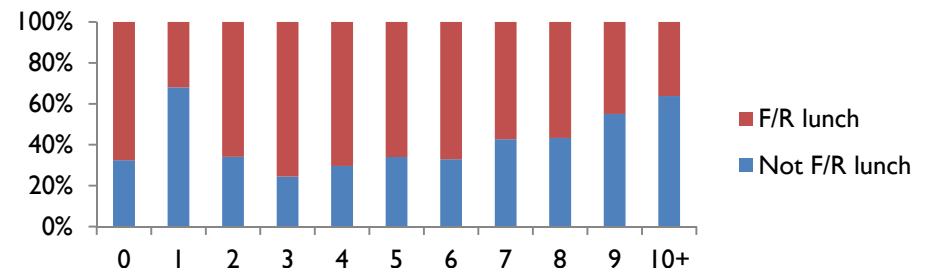
Overall, students who have attended MMSD schools for their entire educational career perform better on the WKCE in grades 4,8, and 10 than those who have not. When looking at no variables other than a student's years spent in MMSD, the relationship between years in MMSD and WKCE scores is positive. Additional time spent in MMSD corresponds to a higher share of students scoring proficient or advanced on both Reading and Math. However, this relationship is not linear; as an example, although students attending MMSD for nine years perform better on the 10th grade Math WKCE than those attending MMSD for three years, there is little difference between students attending MMSD for eight and nine years or between those attending MMSD for two and three years.

Linear regressions estimating the effect of additional years in MMSD on students' WKCE math and reading scores revealed a significant positive impact of additional years in MMSD on test scores for both reading and math and across 4th, 8th, and 10th grades.

**10th Grade Student Demographics
Sorted by Years in MMSD**



**10th Grade Student Demographics
Sorted by Years in MMSD**



The graph above shows, though, that for 10th graders, the demographic composition of recent arrivals is different than that of students with longer tenure in MMSD. Therefore, the difference between recent arrivals to MMSD and those with a longer tenure may also be due to demographic characteristics. These


differences are not uniform across time, though. For the most part, more recent arrivals are less likely to be white and more likely to be low-income. However, 10th grade students with one prior year in MMSD (Grade 9 arrivals) are largely white and not low-income. We believe these students are “strategic movers” who entered MMSD in 9th grade because of programming options, ending open enrollment in a neighboring district, or coming to MMSD from a private/parochial K-8 environment.

To that end, I conducted new regressions, controlling for race, gender, English Language Learner (ELL) status, special education status, free/reduced lunch status, parental education, living in a single-parent household, and attending the same school for a full academic year prior to taking the WKCE (to account for student mobility).

However, these regressions did not produce reliable results because of consistent biases in the residuals, or error terms; the models consistently underpredicted scores for high-performing students and overpredicted scores for low-performing students. I then conducted robust regressions to correct for these errors in estimation.

When controlling for demographic characteristics, only one regression revealed a statistically significant positive relationship between MMSD tenure and WKCE scores: tenure had a significant effect on math scores for students in fourth grade. For other grade levels and subjects, the effects of MMSD tenure were ambiguous.

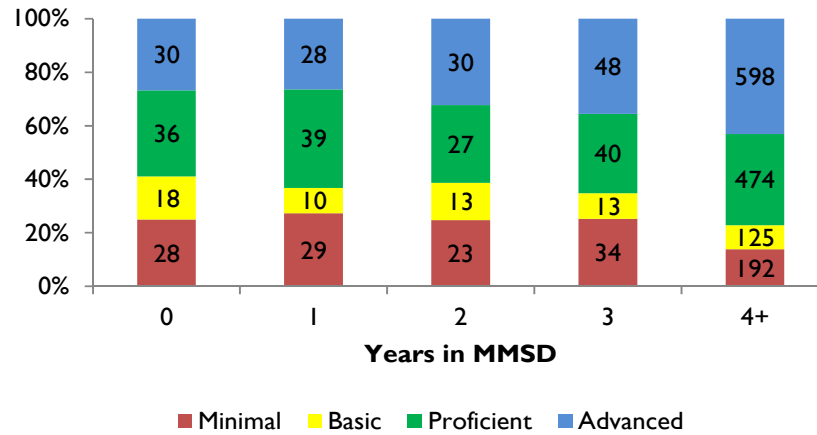
Relationship between years in MMSD and WKCE scores
Controlling for demographics

?		?	?	?	?
4	4	8	8	10	10
Reading	Math	Reading	Math	Reading	Math

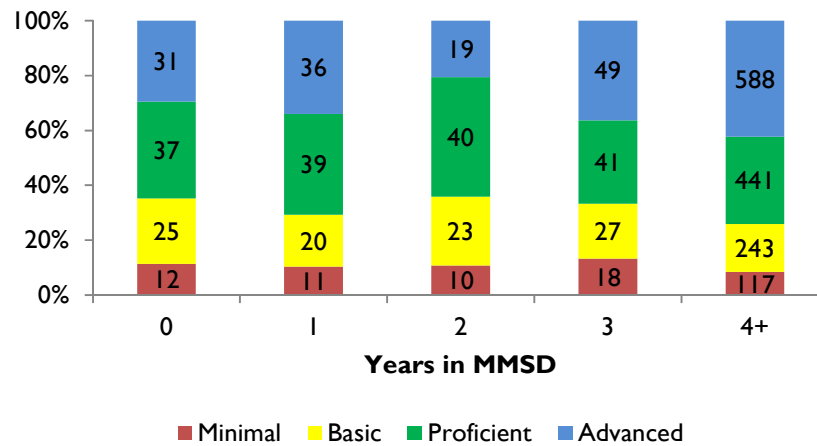
This, of course, does not mean that students who have spent more time in MMSD do not score better than those who do not; the graphs on the last three pages of this document and the regressions mentioned above show that longer-tenured students do tend to do better. Instead, these data suggest that in most cases, the performance difference between students with long and short tenures in MMSD can be explained largely by other demographic characteristics.

The graphs on the following pages show the share of students scoring Minimal, Basic, Proficient, and Advanced on the WKCE, as well as the number of students scoring at each level (contained within each bar segment).

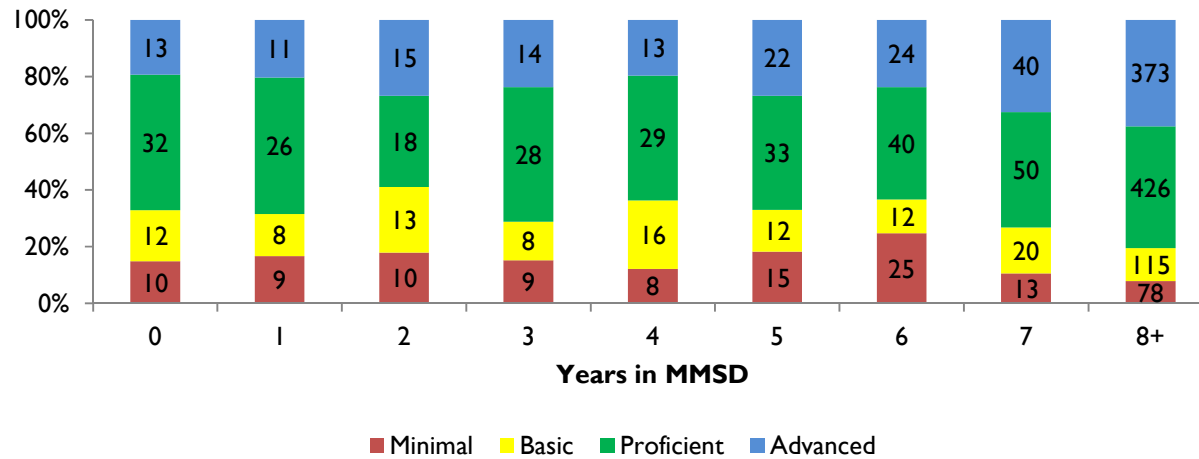
Grade 4 Math



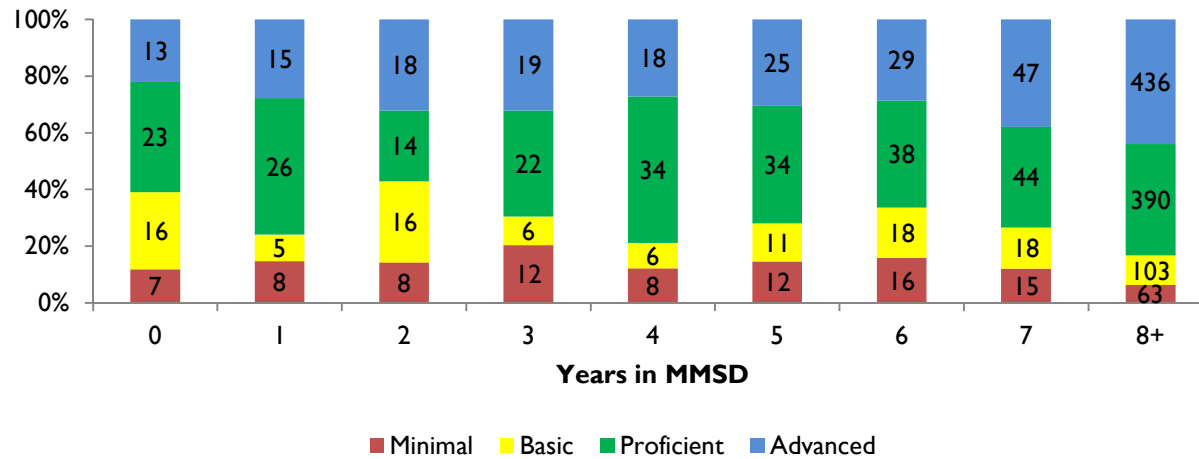
Grade 4 Reading



Grade 8 Math

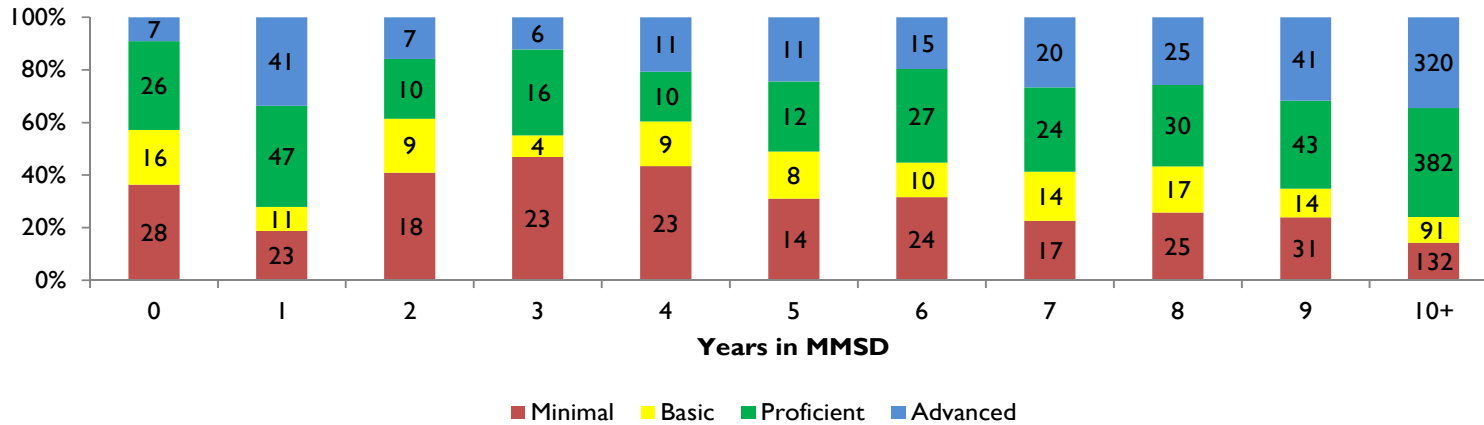


Grade 8 Reading



The most notable anomaly is among 10th grade students. In both Reading and Math, 10th grade students who had spent one year in MMSD performed as well as students who had spent their entire careers in MMSD and substantially better than new students as well as students who had spent between 2 and 9 years in MMSD. This suggests that students who enter MMSD in 9th grade are altogether different from students who enter in other grades. The high performance level for students spending one year in MMSD prior to 10th grade may reflect students entering MMSD in 9th grade after attending private schools through 8th grade.

Grade 10 Math



Grade 10 Reading

