Executive Memo - Evaluation of the KCS Magnet Schools

Casey Ryan, Data Analyst

This study looks at academic and enrollment trends at the magnet schools in Knox County Schools. In 2011, the district moved away from the "school-within-a-school" model and redefined the guiding principles for KCS magnet programs. With race no longer an explicit consideration in transfer or lottery processes, the district focused on 1) providing multiple pathways to success, and 2) leveraging themes and community engagement to support school improvement and success. The following analysis is primarily concerned with the second goal.

Has academic achievement on state assessments at the magnet schools improved longitudinally in comparison to the district?

There are mixed results. Using SY0910 as a baseline, we looked at the difference between each of the magnet schools and the district in terms of test takers scoring as Proficient or Advanced in their core RLA/English and Math subjects. Since SY1112 is the first year that we have test data for L & N STEM Academy, we had to use that year as their baseline. We then calculated the same difference for SY1415 to see whether each school had improved in comparison to the district over time.

There was statistically significant evidence that Austin-East High increased the percent of students scoring as Proficient or Advanced at a faster rate than the district over this period. This means that Austin-East was able to decrease the gap between themselves and the district. There was evidence that Sarah Moore Greene Elementary and Beaumont Elementary also improved this figure at a faster rate than the district, but these results did not meet the test for significance.

Longitudinal Change in Achievement on State Assessments

School	Year	% Below Basic	% Proficient/ Advanced	School	Year	% Below Basic	% Proficient/ Advanced
Beaumont	SY0910	30.5	34.8	Austin-East	SY0910	34.5	26.8
	SY1415	25.5	42.7		SY1415	23.5	40.6
Green	SY0910	34.2	19.5	Fulton	SY0910	22.7	36.2
	SY1415	45.9	10.1		SY1415	23.7	38.1
Sarah Moore Greene	SY0910	43.3	14.4	L & N STEM	SY1112	3.3	84.7
	SY1415	34.3	20.6		SY1415	2.9	82.9
KCS Elementary	SY0910	15.3	48.6	West	SY0910	16.2	54.7
	SY1415	13.2	52.8		SY1415	16.5	60.2
Vine	SY0910	48.9	16.3	KCS High	SY0910	13.5	59.9
	SY1415	41	19.3		SY1112	13.5	61.5
KCS Middle	SY0910	22.5	45.6		SY1415	11.1	65.2
	SY1415	16.6	54.8				

There was statistically significant evidence that the district improved in this metric at a faster rate than Green Elementary and L & N STEM Academy. For Green, this meant that the negative gap between their school and the district widened between SY0910 and SY1415.
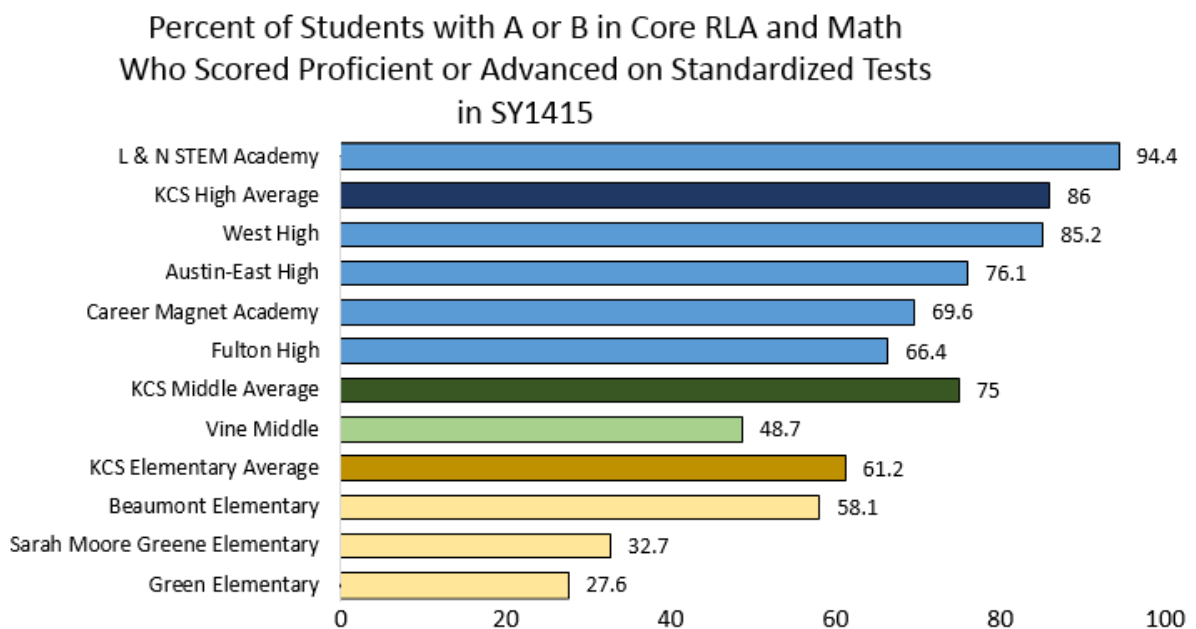
Unlike other schools in this analysis, L & N STEM performed higher than the district on this metric, which means that the positive gap between themselves and the district decreased between SY1112 and SY1415. There was some evidence that the gap with the district widened for Vine Middle and Fulton High, but these results were not statistically significant.

We then applied the same methodology using the percent of test takers scoring as Below Basic in their core RLA/English and Math subjects. There was statistically significant evidence that the percent of students scoring as Below Basic decreased for Austin-East and Sarah Moore Greene at a faster rate than the district, thus making progress toward closing this gap. This figure also decreased faster than the district at Beaumont Elementary and Vine Middle, but the results were not statistically significant.

At Green Elementary and West High, we found statistically significant evidence that the percent of students scoring as Below Basic increased in relation to the district, widening this achievement gap. This gap also increased at Fulton High and L & N STEM Academy, but the results were not statistically significant.

Are the magnet schools providing a higher level of academic rigor than would be received in a student's zoned school?

Among the defining principles set out for the magnet programs in 2011 are higher academic standards and curricular alignment with Tennessee standards. As a measure of academic rigor and expectations within each school, we looked at how often an A or B in core subjects translated to an achievement level of Proficient/Advanced on these same subjects in SY1415. For each school, we calculated the percentage of students with either an A or B in their core Math and RLA courses who also scored Proficient/Advanced on state assessments in those areas.

Percent of Students with A or B in Core RLA and Math Who Scored Proficient or Advanced on Standardized Tests in SY1415

School	Value
L & N STEM Academy	94.4
KCS High Average	86
West High	85.2
Austin-East High	76.1
Career Magnet Academy	69.6
Fulton High	66.4
KCS Middle Average	75
Vine Middle	48.7
KCS Elementary Average	61.2
Beaumont Elementary	58.1
Sarah Moore Greene Elementary	32.7
Green Elementary	27.6

This proportion was below the KCS average for that grade band at all schools except for L & N STEM Academy. This difference was statistically significant at all schools except for Beaumont Magnet and West High. In other words, at most of the magnet schools, the metric for academic success in the classroom (an A or B) translates to academic achievement on state assessments (Proficient or Advanced) at a lower rate than the district average. While individual cases vary, there is evidence that the average magnet transfer student at one of these schools did not receive the same level of academic rigor and alignment to Tennessee standards in their core Math and RLA instruction in SY1415 as they would have received at their zoned school.

Do students zoned outside of magnet schools perceive the magnet programs to be high quality? Has the percentage of enrolled students on a magnet transfer increased over time at the magnet schools?

L & N STEM Academy and Career Magnet Academy are composed entirely of students on a magnet transfer, so this question did not apply to them. For the remaining schools, we calculated the percentage of their total enrollment that consisted of students on a magnet transfer in SY1213. We then compared this figure to the SY1617 enrollment data using chi-square testing to check for significance.

There was a statistically significant increase in the proportion of magnet transfer students to non-magnet transfer students at Beaumont Elementary, Green Elementary, Austin-East High, Fulton High, and West High. There was a slight increase at Vine Middle, but the results were not significant. Sarah Moore Greene Elementary saw a 4% decrease in the percentage of enrolled students on a magnet transfer in SY1213 to SY1617. This change was statistically significant.

Change in Enrollment at Magnet Programs from SY1213					
School	Year	Magnet Students	All Students	Percent Magnet	Percent Change
Beaumont	SY1213	179	526	34%	-
	SY1617	208	526	40%	6%
Green	SY1213	25	304	8%	-
	SY1617	49	366	13%	5%
Sarah Moore Greene	SY1213	96	641	15%	-
	SY1617	64	591	11%	-4%
Vine	SY1213	78	343	23%	-
	SY1617	86	355	24%	2%
Austin-East	SY1213	38	573	7%	-
	SY1617	58	649	9%	2%
Fulton	SY1213	21	925	2%	-
	SY1617	101	985	10%	8%
West	SY1213	85	1234	7%	-
	SY1617	157	1373	11%	5%

What is the internal perceived program quality at the magnet schools? Once enrolled, are students staying at these schools? How has this figure changed over time?

As a proxy for perceived program quality, we looked at the ratio of early withdrawals out of a magnet program in relation to the number of new magnet enrollments for each school year. We defined an early withdrawal as a student moving to either another KCS school, home school, or a private school before progressing to the next grade band. We did not count cases where a student moved to another district or state or cases where a student transferred for legal, medical, or other reasons. While not exact, this gives us a rough measure of whether or not the marginal value of staying in the magnet school is greater than the marginal value of enrolling somewhere else in Knox County.

SY1617 Perceived Program Quality			
School Name	Early Withdrawals	New Transfers	Ratio
Sarah Moore Greene Elementary	7	10	0.70
Career Magnet Academy	45	106	0.42
Green Elementary	9	27	0.33
L & N STEM Academy	51	176	0.29
Vine Middle	13	53	0.25
Beaumont Elementary	15	65	0.23
Fulton High	9	43	0.21
West High	7	46	0.15
Austin-East High	3	26	0.12
All Schools	**159**	**552**	**0.29**

We then looked at the longitudinal change in the above measure, using SY0910 as the baseline year for all schools already serving as magnet programs at that time. For schools implementing magnet programs after SY0910, we set the first year accepting magnet transfers as the baseline year.

Linear regression analysis shows that this ratio has increased at all magnet schools except for Beaumont, Vine, and Austin-East. The increase was statistically significant at Sarah Moore Greene (+8.8% per year) and close to significance at Fulton (+4.3% per year) and L & N STEM (+3.4% per year). While the lack of statistical significance at Career Magnet is likely due to the limited number of data points available, the change from SY1516 to SY1617 may be a reason for concern.

Perceived Program Quality at Career Magnet			
School Year	Early Withdrawals	New Transfers	Ratio
SY1415	20	124	0.16
SY1516	19	123	0.15
SY1617	45	106	0.42

This trend at Beaumont was essentially flat (+0.1% per year). The ratio decreased at Vine (-3.8% per year) and Austin-East (-1.4% per year). Neither of these trends were statistically significant, although it was close at Vine (p = 0.056).

Master Table – Magnet Program Evaluation Metrics

	Quality of Magnet Programming	Longitudinal Change in School Achievement - Proficient/Advanced (0910-1415)	Longitudinal Change in School Achievement - Below Basic (0910-1415)	School-wide Academic Rigor (1415)	External Perceived Quality - Enrollment (0910-1617)	Internal Perceived Quality - Persistance (0910-1617)
Beaumont Elementary	Green	Green	Green	Yellow	Blue	Yellow
Green Elementary	Green	Red	Red	Red	Blue	Pink
Sarah Moore Greene Elementary	Pink	Green	Blue	Red	Red	Red
Vine Middle	Yellow	Pink	Green	Red	Yellow	Green
Austin-East High	Green	Blue	Blue	Red	Blue	Green
Career Magnet Academy	Green	n/a	n/a	Red	n/a	Pink
Fulton High	Green	Pink	Pink	Red	Blue	Pink
L & N STEM Academy	Green	Red	Pink	Blue	n/a	Pink
West High	Green	Yellow	Red	Yellow	Blue	Pink

Legend	Color
Significant Positive Evidence	Blue
Some Positive Evidence	Green
Insufficient Evidence/Mixed Results	Yellow
Some Negative Evidence	Pink
Significant Negative Evidence	Red
Data Not Available/Applicable	n/a