Funding Achievement in Kentucky

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Background

It is no surprise that the proper education of a population ranks high on the list of important accomplishments within a society. After all, a population's education can affect its ability to perform at a high capacity. The education of Kentucky's children is no different. Recent years have seen large disparities in the resources available to each school in Kentucky, which could have effects on the educational output of regions in the state. Though research has been conducted on concepts such as school funding, educational quality, and education reform, this research tends to be lacking in specificity and consistency. (DeYoung, 1985) Some research concerns itself with the effects of funding on educational output, the effects of which are unknown and can even be seen as contradictory when controlling for social and economic factors. (Walberg & Fowler, 1987)

Literature Review

- (Coulson, 2014; Hanushek, 1989; and Walberg & Fowler, 1987): These studies assert that there is little or no correlation between increased funding metrics and associated educational outcomes.
- (Friedkin & Necochea, 1988): Larger school district populations provide an economic foundation to build upon, providing socio-economic amenities that are unavailable in smaller regions.
- (Jackson, Rucker, Persico, 2014): There are positive benefits that occur for poorer students that can be associated with increased educational spending.
- (Lips & Watkins, 2008): This study asserts that a mere increase of educational spending does not necessarily improve academic achievement or output by schools.
- (Rainey & Murova, 2004): There is a positive correlation between increased teacher salaries and educational achievement.
- (Reeves & Bylund, 2005): There is little difference, in terms of an educational gap, between schools in urban and rural areas.

Purpose

This study holds a high level of importance in regard to the inconsistency that exists among current research on the topic. A number of studies, such as those by Andrew Coulson and Eric Hanushek, express results that assert that there is no, or generally a weak, correlation between the funding a school receives and the educational outputs or achievements of that school. (Coulson, 2014; Hanushek, 1989) Other studies, however, assert that there is a strong correlation between increased funding and metrics such as high school completion rates, adult earnings, and even family incomes. (Jackson, Rucker, and Persico, 2014) Ultimately, the ambiguity surrounding the results of studies on school funding, in various forms, and the related effects on educational outcomes presents the basis for the necessity of a study such as our own. This paper contribute to the literature by adding necessary specificity to the relationship between ACT scores and related educational funding metrics.

Research Methods

The focus of this study being to realize the greatest impact for educational achievement in Kentucky, we use longitudinal panel data pulled from the Kentucky School Report Card data sets published annually by the Kentucky Department of Education. This will be used in accordance with county level demographic data over an 8-year span, beginning with the 2011-2012 school year and ending with the 2018-2019 school year to measure the impact of school resources on education output (ACT scores, specifically). School resources will be measured using the following three iterations of school funding: total spending per student, student-teacher ratio (class size), and technology available per student (specifically a ratio of students per computer). Characteristics will be controlled for at both the school and county levels, with the hope that the controlling for such will isolate the direction and the magnitude of the impact of our independent variable on our dependent variable, that being ACT scores.

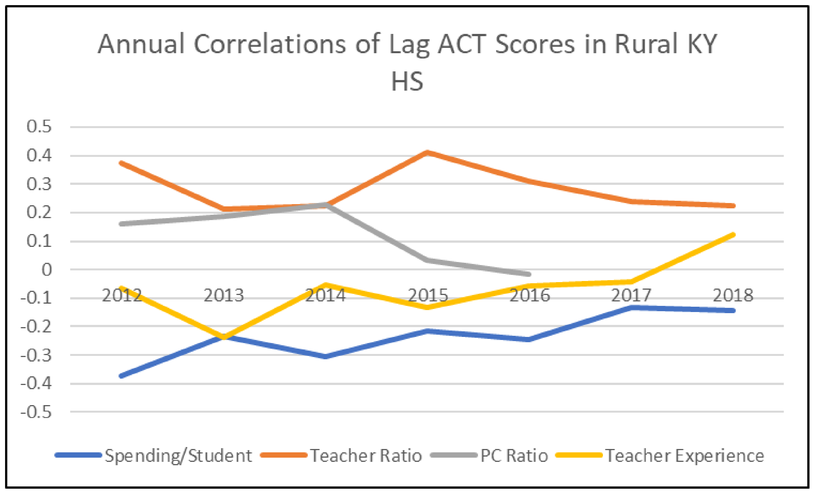

Table 1. Fixed-Effect Models of Mean ACT Scores for KY Rural High Schools

	Spending Model			*Technology Model*			*Teacher Ratio Model*			*Teacher Experience*			*Full Model*		
	Coeff		Robust Standard Error	Coeff		Robust Standard Error	Coeff		Robust Standard Error	Coeff		Robust Standard Error	Coeff		Robust Standard Error
Instructional Spending Per Student	0.22973	***	0.03911										0.30791	***	0.04508
PCs per Student				-0.00284		0.01155							0.01050		0.00930
Students Per Teacher							-0.00727	*	0.00300				-0.00622	***	0.00124
Mean Teacher Experience	0.01744		0.01735	0.06613	**	0.02292	0.01573		0.01645	0.02679	*	0.01221	0.03063		0.01828
Mean County Income	0.23522	*	0.00001	0.65788	***	0.00001	0.57740	***	0.00001	0.57044	***	0.00001	0.43000	***	0.00001
County Drug Arrests per 100 K	0.00008	*	0.00004	0.00010	*	0.00005	0.00011	**	0.00004	0.00012	**	0.00004	0.00005		0.00004
County Population	-0.00003	*	0.00001	0.00002		0.00002	-0.00003		0.00001	-0.00002		0.00001	-0.00001		0.00002
School Enrollment	-0.00010		0.00010	0.00001		0.00010	-0.00007		0.00010	-0.00008		0.00010	-0.00004		0.00008
Current Year ACT Average	0.05303		0.03197	-0.02711		0.04757	0.07369	*	0.03184	0.07549	*	0.03146	-0.11170	*	0.04814
Constant	17.14259		0.83223	16.44036		1.22725	17.17728		0.84966	16.79183		0.85362	18.31220		1.21571

* $p < .05$, ** $p < .01$, *** $p < .001$

Preliminary Results

This study yielded the following results:

- The Instructional Spending Per Student Metric had significant impacts, both within its own model and within the full model, revealing a increase of 0.31 points in ACT score the following year for every $1,000 increase the initial year.
- The ratio of Students Per Teacher also yielded a significant impact, though less so than Instructional Spending Per Student, revealing a decrease of 0.006 points in ACT score for each additional student in a single classroom.
- The Mean Teacher Experience metric yielded a significant impact as well, providing an increase of 0.03 points in ACT score for each additional average year of experience.
- The Mean County Income metric revealed the fact that wealthier counties (measured in county per capita income) saw statistically higher ACT scores for students.
- The PC's Per Student metric was statistically insignificant across all models.

Conclusions

The results of this study have multiple implications for Kentucky's rural schools:

- Ultimately, instructional spending by schools is a metric of great importance. This study reveals that increases in instructional spending levels per student can increase the average ACT scores of students within that school. Seeing as the ACT is an important exam for admittance to college, the advocation for increased instructional funding should be at the forefront of attempts to increase school educational output.
- Though it tends to have a lesser effect than that of instructional spending, the numbers of students a teacher is responsible for educating matters. As this ratio increases (meaning more students per teacher), ACT scores tend to decline. Reducing classroom sizes can lead to higher educational output, especially concerning methods of standardized testing.
- Finally, the average years of teaching experience among a school's staff is important. This study has shown that increasing the average teaching experience of a school's staff can lead to increases in ACT scores, and therefore educational output.

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