

Apr 4th, 9:00 AM - 9:50 AM


An Analysis of the Relationship between K-12 Public Education Spending and Student Academic Achievement in Iowa

Lydia Berns-Schweingruber
University of Northern Iowa

Let us know how access to this document benefits you

Copyright ©2023 Lydia Berns-Schwingruber

Follow this and additional works at: <https://scholarworks.uni.edu/csbsresearchconf>

 Part of the [Educational Sociology Commons](#), [Education Policy Commons](#), and the [Elementary and Middle and Secondary Education Administration Commons](#)

Recommended Citation

Berns-Schweingruber, Lydia, "An Analysis of the Relationship between K-12 Public Education Spending and Student Academic Achievement in Iowa" (2023). *INSPIRE Student Research and Engagement Conference*. 32.

<https://scholarworks.uni.edu/csbsresearchconf/2023/all/32>

This Open Access Poster Presentation is brought to you for free and open access by the CSBS Conferences/Events at UNI ScholarWorks. It has been accepted for inclusion in INSPIRE Student Research and Engagement Conference by an authorized administrator of UNI ScholarWorks. For more information, please contact scholarworks@uni.edu.

Offensive Materials Statement: Materials located in UNI ScholarWorks come from a broad range of sources and time periods. Some of these materials may contain offensive stereotypes, ideas, visuals, or language.

An Analysis of the Relationship between K-12 Public Education Spending and Student Academic Achievement in Iowa

Lydia Berns-Schweiggruber | Sociology & Elementary Education Major | bernssl@uni.edu
 Kristin Mack and Marybeth Stalp | Faculty Advisors | College of Social & Behavioral Sciences



Abstract

Student academic achievement in Iowa is on the decline (US Department of Education 2022). Some politicians propose increasing public education spending in order to address worrisome trends in academic achievement (Richardson 2022). Prior studies disagree about whether there is a relationship between school spending and student outcomes. The purpose of this study is to determine if there is a relationship between K-12 public education spending and student academic achievement in Iowa. This project analyzes data from the past nineteen years to examine the relationship between Iowa's per-pupil expenditure and student outcomes — specifically, graduation rate, average daily attendance, math proficiency, and ELA/reading proficiency. Results demonstrate that there is no significant relationship between Iowa's per-pupil expenditure and student academic achievement. While per-pupil expenditure in Iowa has increased over the past nineteen years, student outcomes have not improved. Policymakers and future researchers need to consider why Iowa's student academic achievement is on the decline in order to effectively address the issue.

Background

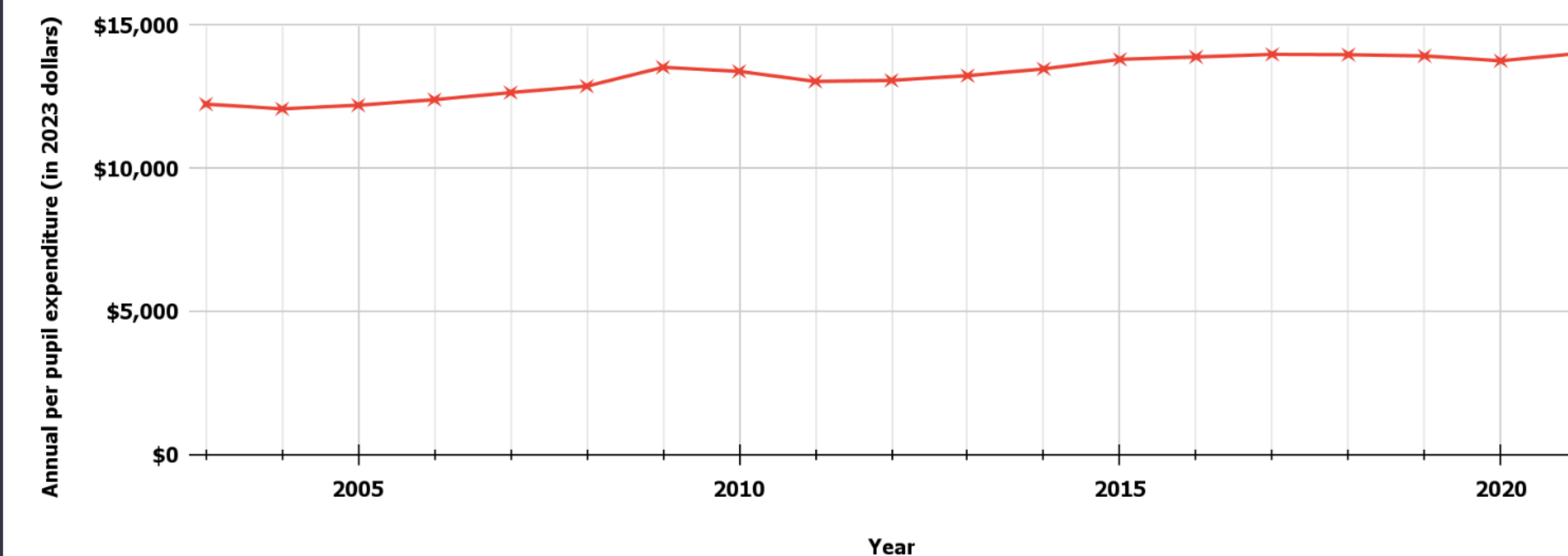
The modern debate on the relationship between school spending and student achievement began with the publication of the Coleman Report in 1966, which found no significant correlation between school resources and student outcomes (Coleman et al. 1966). Since that time, many researchers have examined the relationship between school spending and student achievement. Previous studies disagree about the association between school spending and student outcomes. Some studies (Betts 1995; Coleman 1966; Hanushek 1986; Martorell et al. 2016) claim that there is no significant relationship between school spending and student achievement. Other studies (Card and Krueger 1996; Card and Payne 2002; Downes and Figlio 1998; Greenwald et al. 1996; Jackson et al. 2015; Lafortune et al. 2018; Miller 2018; Rajpal 1969) suggest a positive relationship between school spending and student outcomes. There is no clear consensus among researchers about the relationship between school spending and student achievement.

Research Question

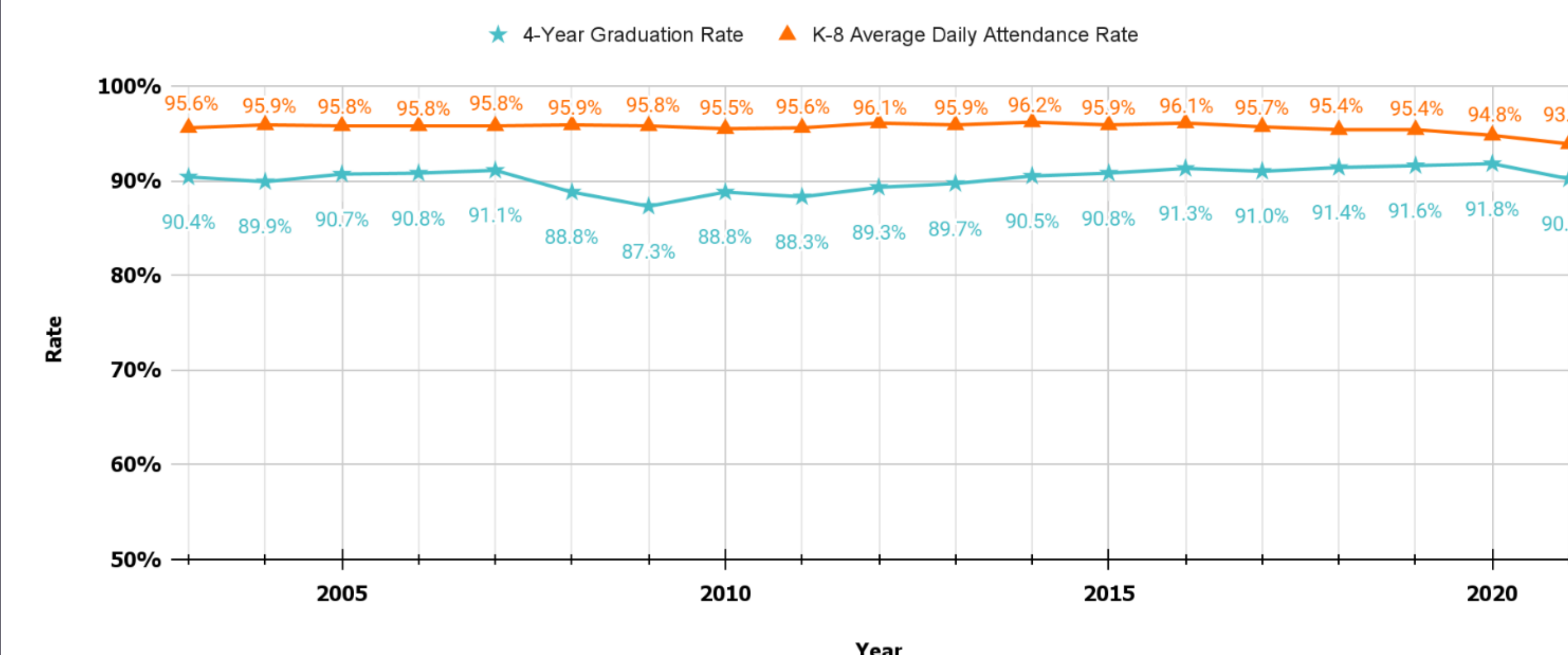
Is there a relationship between public education spending and student academic achievement in Iowa?

Analysis

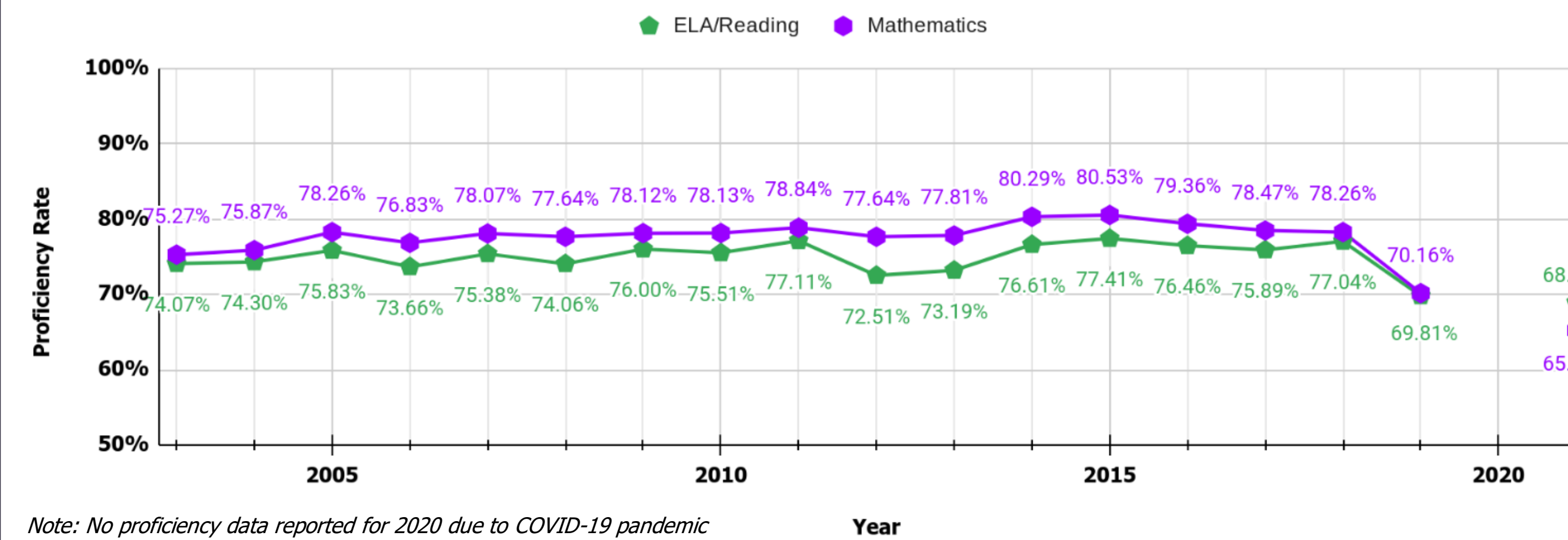
Per-Pupil Expenditure (in 2023 Dollars) for Iowa Public Schools 2003 - 2021



4-Year Graduation Rate and K-8 Attendance Rate for Iowa Public Schools 2003 - 2021



Student Proficiency for ELA/Reading and Math on Iowa State Assessments 2003 - 2021



Univariate Analysis of Per-Pupil Expenditure and Student Outcomes

	Minimum	Maximum	Range	Mean	Median	Standard Deviation
Adjusted Per-Pupil Expenditure (2023 dollars)	12085.58	14016.18	1930.60	13244.97	13394.71	666.72
4-Year Graduation Rate	87.3	91.8	4.50	90.19	90.50	1.22
K-8 Average Daily Attendance Rate	93.9	96.2	2.30	95.64	95.80	0.53
ELA/Reading Proficiency	68.95	77.11	8.46	74.66	75.45	2.39
Mathematics Proficiency	65.21	80.53	15.32	76.93	78.10	3.70

Bivariate Analysis of Per-Pupil Expenditure and Student Outcomes

	Pearson Correlation	Significance (2-tailed)	Significant Correlation? (Is P ≤ 0.05?)
Per-Pupil Expenditure & Graduation Rate	0.204	0.402	No
Per-Pupil Expenditure & Attendance Rate	-0.362	0.128	No
Per-Pupil Expenditure & ELA/Reading Proficiency	-0.039	0.877	No
Per-Pupil Expenditure & Mathematics Proficiency	-0.153	0.545	No

Methods

This study analyzes data from 2003 to 2021 to examine the relationship between K-12 public education spending and student academic achievement in Iowa. K-12 public education spending is measured as the annual per-pupil expenditure in Iowa public schools. Per-pupil expenditure data is obtained from the United States Census Bureau's Annual Survey of School System Finances. The annual per-pupil expenditure is adjusted for inflation and reported in 2023 dollars. Inflation is adjusted using a calculator based on the US Consumer Price Index (CPI) data from the U.S. Labor Department. Student academic achievement is analyzed using four variables — the percent of students scoring proficient or above on English Language Arts (ELA)/reading assessments, the percent of students scoring proficient or above on mathematics assessments, the K-8 average daily attendance rate, and the 4-year graduation rate for Iowa public high schools. Data to measure student academic achievement is obtained from the Iowa Department of Education's State Report Cards and Performance Profiles. There are no student test scores reported in 2020 due to COVID-19. IBM SPSS Statistics software was used to run univariate and bivariate analysis.

Findings

Increase in expenditure: From 2004 to 2021, there was a 15.97% increase in per-pupil expenditure (adjusted for inflation) from \$12,085.58 (2004) to \$14,016.18 (2021).

Fairly constant graduation & attendance rates: From 2003 to 2021, there was a 4.5% range for graduation rate — 87.3% at its lowest (2009) to 91.8% at its highest (2020). There was a 2.3% range for attendance rate — 93.9% at its lowest (2021) to 96.2% at its highest (2014).

Variability in proficiency rates with lowest in 2021: From 2003 to 2021, there was a 8.46% range for ELA/reading proficiency rate — 77.41% at its highest (2015) to 68.95% at its lowest (2021). From 2003 to 2021, there was a 15.32% range for mathematics proficiency rate — 80.53% at its highest (2015) to 65.21% at its lowest (2021).
 *2018-2019 drop in proficiency scores may be affected by Iowa's switch to ISASP

No significant relationship between per-pupil expenditure and any student outcome

References

Betts, Julian R. 1995. "Does School Quality Matter? Evidence from the National Longitudinal Survey of Youth." *The Review of Economics and Statistics*. 77(2):231-250.

Card, David, and A. Abigail Payne. 2002. "School Finance Reform, The Distribution of School Spending, and The Distribution of Student Test Scores." *Journal of Public Economics*. 83:49-82.

Coinnews Media Group LLC. 2022. *US Inflation Calculator*. <https://www.usinflationcalculator.com>

Card, David, and Alan B. Krueger. 1996. "School Resources and Student Outcomes: An Overview of the Literature and New Evidence from North and South Carolina." *Journal of Economic Perspectives*. 10(4):31-50.

Coleman, James S., Ernest Q. Campbell, Carol J. Hobson, James McPartland, Alexander M. Mood, Frederic D. Weinfeld, and Robert L. York, 1966. *Equality of Educational Opportunity*. Washington, D.C.: Government Printing Office.

Downes, Thomas A. and David N. Figlio. 1997. "School Finance Reforms, Tax Limits, and Student Performance: Do Reforms Level Up or Dumb Down?" *Institute for Research on Poverty*. Discussion Paper no. 1142-97.

Greenwald, Rob, Larry V. Hedges, and Richard D. Laine. 1996. "Resources on Student Achievement." *Review of Educational Research*. 66(3):361-396.

Hanushek, Eric A. 1986. "The Economics of Schooling: Production and Efficiency in Public Schools." *Journal of Economic Literature*. 24(3):1141-1177.

Iowa Department of Education. 2017. *State Report Cards*. Des Moines, Iowa: Iowa Department of Education.

Iowa Department of Education. 2022. *Iowa School Performance Profiles*. Des Moines, Iowa: Iowa Department of Education.

Jackson, C. Kirabo, Rucker C. Johnson, and Claudia Persico. 2015. "The Effects of School Spending on Educational and Economic Outcomes: Evidence from School Finance Reforms." *The Quarterly Journal of Economics*. 131(1):157-218.

Lafortune, Julien, Jesse Rothstein, and Diane Whitmore Schanzenbach. 2018. "School Finance Reform and the Distribution of Student Achievement." *American Economic Journal: Applied Economics*. 10(2):1-26.

Martorell, Paco, Kevin Stange, and Isaac McFarlin Jr. 2016. "Investing in schools: capital spending, facility conditions, and student achievement." *Journal of Public Economics* 140:13-29.

Miller, Corbin L. 2018. "The Effect of Education Spending on Student Achievement: Evidence from Property Values and School Finance Rules." *Annual Conference on Taxation and Minutes of the Annual Meeting of the National Tax Association* 79:1-121.

Rajpal, Puran L. 1969. "Relationship between Expenditures and Quality Characteristics of Education in Public Schools." *The Journal of Educational Research* 63(2):57-59.

Richardson, Ian. 2022. "Kim Reynolds and Deirdre DeJear Spar in Their Only Iowa Governor Debate: Here's What They Said." *The Des Moines Register*, October 17.

U.S. Bureau of the Census. 2022. *Annual Survey of School System Finances Tables*. Washington, DC: U.S. Department of Commerce.

U.S. Department of Education. 2022. *The Nation's Report Card: Iowa Overview*. Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP).