EXHIBIT E

Impact of School and District Size: Educational and Extracurricular Impacts

Robert Schoch, Education Finance Decisions

Presentation to the Senate Committee on Education
and the House Committee on Education
Little Rock, Arkansas
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Research Questions and Methodology

- **Research Questions**
  - How do the sizes of schools and school districts impact the educational and extracurricular programs?
  - What is the impact of school and school district size on the community?
- **Research Methodology**
  - Review of research findings and practices regarding school and district size
  - Analysis of relevant information from the ADE Data Center correlated with school district and school size information
  - Analysis of extracurricular information collected by the Arkansas Activities Association for both athletic and non-athletic activities

Presentation Overview

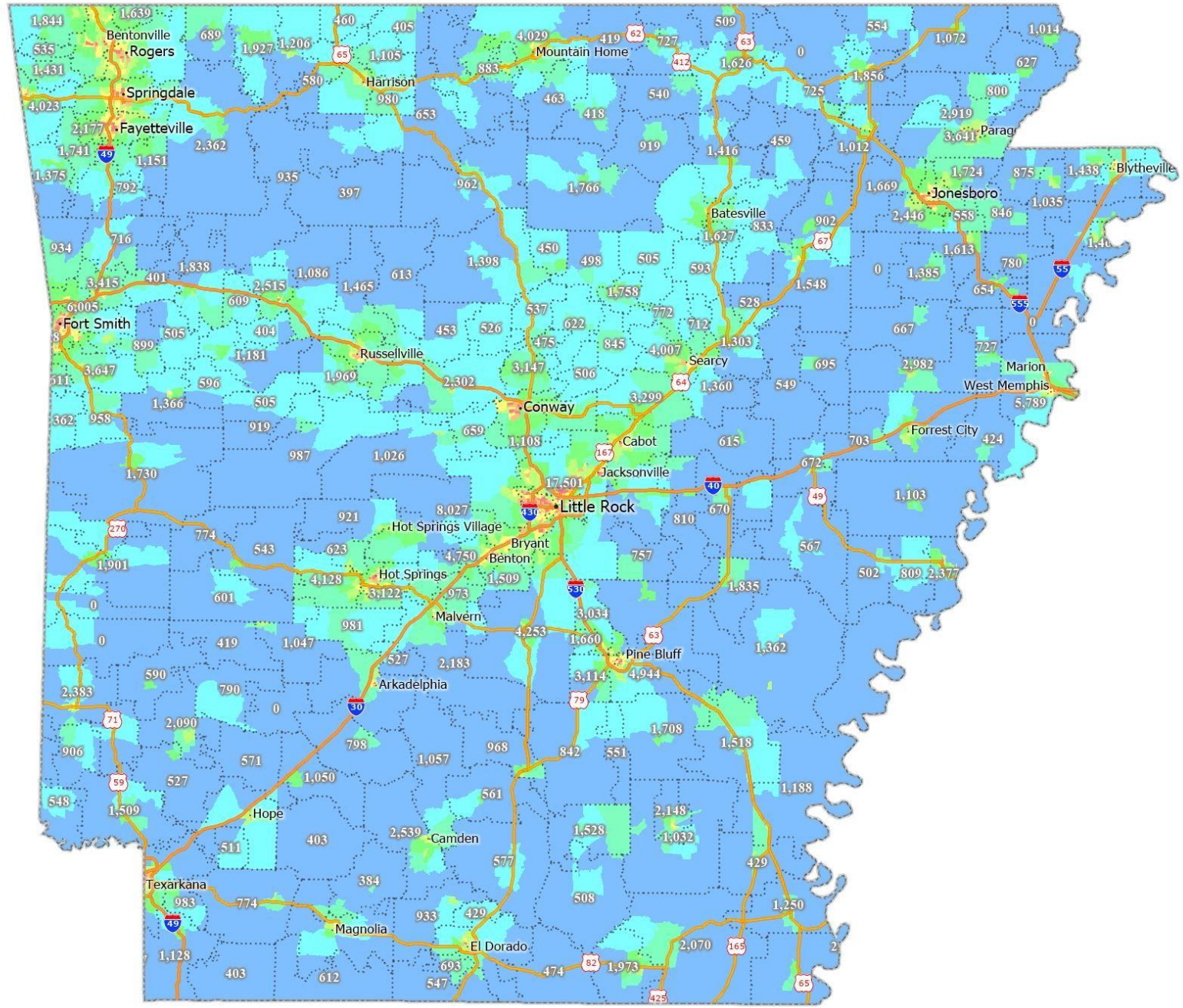
- Background information
- District size
  - National research
  - Arkansas compared to national research (preview of findings before data shown)
  - Data analysis – selected analysis
- School size
  - National research
  - Arkansas compared to national research (preview of findings before data shown)
  - Data analysis – selected analysis
- Appendix – extensive analysis

Background Information

- District size (enrollment) is constantly changing
  - Population increases/decreases
    - Birth rate varies from year to year, economic opportunities change
    - Enrollment projections – updated by consultant annually, used in districts' Master Plans, accurate in the short-term
  - Consolidation of districts
- School Size
  - School size depends on:
    - Grade level configuration
    - Enrollment trends
    - Population density – travel time/distance from homes to schools

Population Density of School Districts

Density affects both school district and school size and many factors impacting districts and schools.

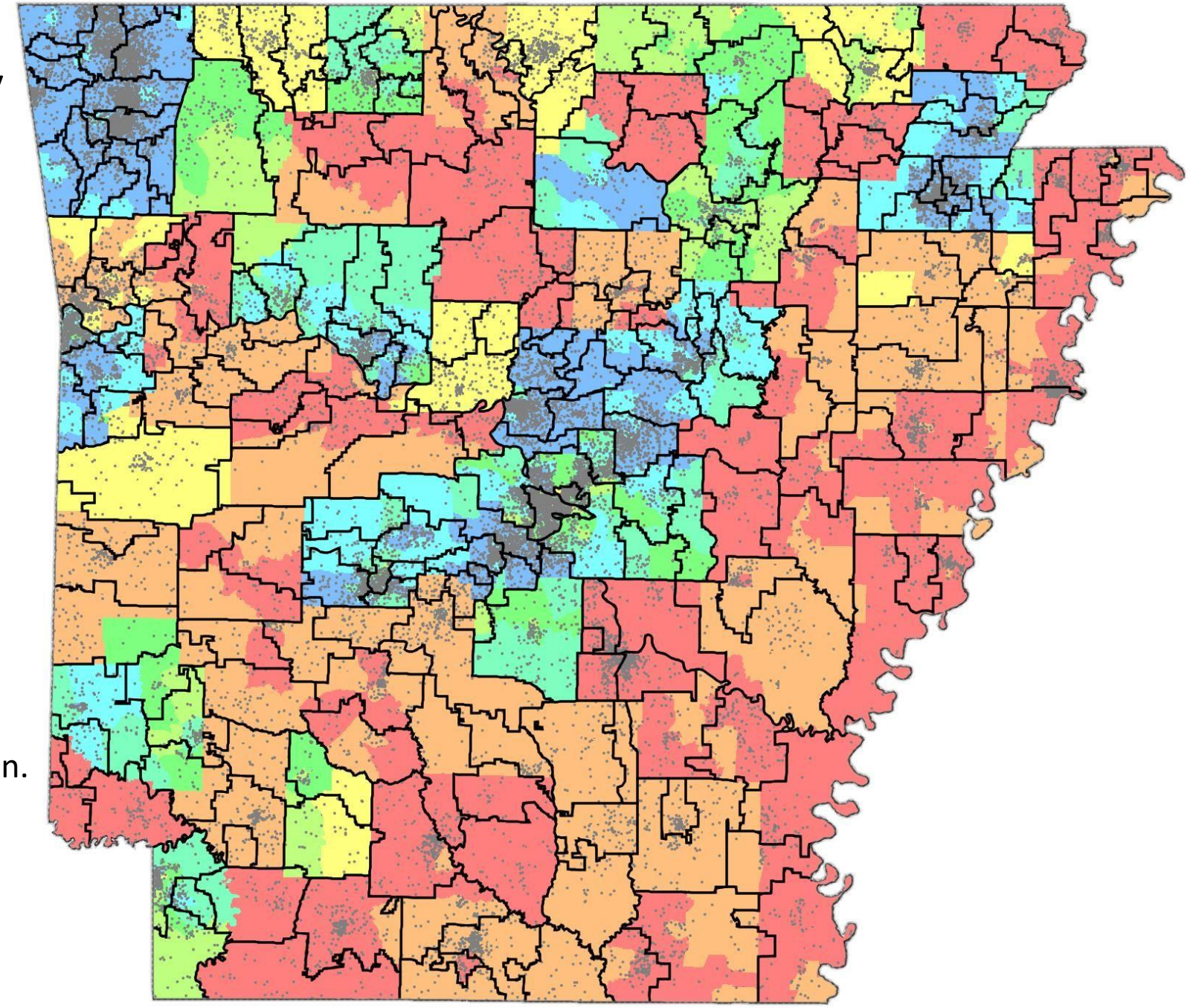


Population Density Map

Combines School Data and US Census Data
Updated Annually by ACS (American Community Survey)

Colors show 10 year population change.

Black dots represent Population density.
Red districts are losing population, while green and blue districts are gaining in total population.



District Size

District Size - Arkansas Compared to National Data

Year	Enrollment size of district									
	Total	25,000 or more	10,000 to 24,999	5,000 to 9,999	2,500 to 4,999	1,000 to 2,499	600 to 999	300 to 599	1 to 299	Size not reported
	Number of districts									
National, 2014-15	13,601	288	609	1,046	1,898	3,221	1,766	1,880	2,687	206
	Percentage distribution of districts									
National, 2014-15	100.0	2.1	4.5	7.7	14.0	23.7	13.0	13.8	19.8	1.5
Arkansas, 2018-19	100.0	0	3.0	3.0	11.4	28.0	25.8	22.3	6.4	
	Percentage distribution of students									
National, 2014-15	100.0	35.7	19.2	15.0	13.9	10.8	2.9	1.7	0.8	
Arkansas, 2018-19	100.0	25.7	11.6	21.2	24.0	11.2	5.7	0.6	0.0	

SOURCE: U.S. Department of Education, National Center for Education Statistics, Common Core of Data (CCD), "Local Education Agency Universe Survey," 1979-80 through 2014-15. (This table was prepared November 2016.)

Public School Districts in the United States

1940 - 117,108 1950 - 83,718 1960 - 40,520
1970 - 17,995 1980 - 15,944 1990 - 15,367
2000 - 14,928

Research on District Size

- Numerous studies have reviewed the impact of school and district size on:
  - Curricular diversity: comprehensive and diverse offerings
  - Extracurricular programs: comprehensive offerings and participation
  - Operational efficiency: economies of scale
  - Academic achievement
  - Other variables: daily attendance, dropout rates, discipline issues
- Research conclusions vary and are subject to bias by advocates or opponents of consolidation
- No consensus exists on whether large districts offer a better educational program and economic efficiency
- Economic efficiency has been found to increase to an optimal enrollment, then remain constant or even increase with size increases, forming a U-shaped curve
- Educational and financial gains expected through consolidation of smaller school districts in larger districts often do not match actual outcomes
- Student achievement is related to many factors, particularly socioeconomic factors of the school community

Research on Optimal District Size

- Some recent studies indicate:
  - Optimal minimum size of a school district ranges from 400 to 2,000 students
  - Optimal maximum size ranges from 4,000 to 6,000 students

(Bingler et al., 2002; Duncomb, 2007; Nguyen-Hoang and Yinger, 2014; Howley et al. 2011, Indiana State Legislature, 2007; Inerman and Ottto, 2003; Preston et al., 2013)

District Size - Arkansas Compared to Research

- Over 100 variables were analyzed to determine the relationship of each to district size
- The variables were categorized and analyzed using the capabilities of the ADE Data Center
- One or two variables in each category will be presented today, first by school district size, then by school size. A lengthy Appendix is provided with the other variables in each category that were analyzed
- The specific and general findings are presented today in a summary table for each category

Use of ADE Data Center Information to Correlate School and District Size with Numerous Variables

Source: ADE Data Center-School District Variables

Some analyses are useful in the identification of best practice school districts or schools.

District Variables-General and Student Categories	Count of Variable	Category
Arkansas Better Chance (ABC) Enrollment	10	
Attendance Rates	20	
Average Daily Membership	5	
Career Education Completers	16	Curriculum Diversity
Computer Science Enrollment by Grade & Race (Act 187 of 2015*)	32	Curriculum Diversity
Course Enrollment	12	Curriculum Diversity
Demographics	18	
Demographics Percentage	17	
Disciplinary Actions	18	Climate
Disciplinary Infractions	24	Climate
Dropouts & Withdrawals	21	Performance
Enrollment by Grade & Race	26	
Free/Reduced Paid Lunch Counts	7	
Free/Reduced Paid Lunch Percentages	2	
General	10	
Gifted & Talented	10	Curriculum Diversity
Graduates	10	Performance
Graduation Rates	17	Performance
Health - Hearing	5	Program Evaluation
Health - Vision	5	Program Evaluation
High School Computer Science Enrollment by Course (2014-2017)	22	
High School Computer Science Enrollment by Course (2018-2020)	78	Curriculum Diversity
Homeless	10	
Immunization Exemptions - Act 676 of 2019	3	Program Evaluation
Military Dependents	14	
Pre-Kindergarten Enrollment	10	Program Evaluation
Retention	10	Performance
School Choice	15	
Student Home Language	2	
Grand Total	**449**	

Correlations - How to Interpret a Scattergram

- Horizontal axis is enrollment, district or school, increasing from bottom to top
- Vertical axis is variable being analyzed, increasing from left to right
- Dots identify a school district's value on both variables
- Correlation coefficient – a statistical measure of the strength of the relationship between the relative movements of two variables. The values range between -1.0 and 1.0. The degree of correlation:
  - Perfect: If the value is near ± 1, then it is a perfect correlation: as one variable increases, the other variable tends to also increase (if positive) or decrease (if negative).
  - High degree: If the coefficient values is over +-0.70, it is a strong correlation.
  - If the coefficient value is between ± 0.50 and ± 0.7, it is a moderate correlation.
  - If the coefficient values is below +-0.40, it is a weak correlation.
- Trendlines-steeper, up or down, show a stronger relationship
- Identification of outliers-often unique circumstances, sometimes indicative of a best practice

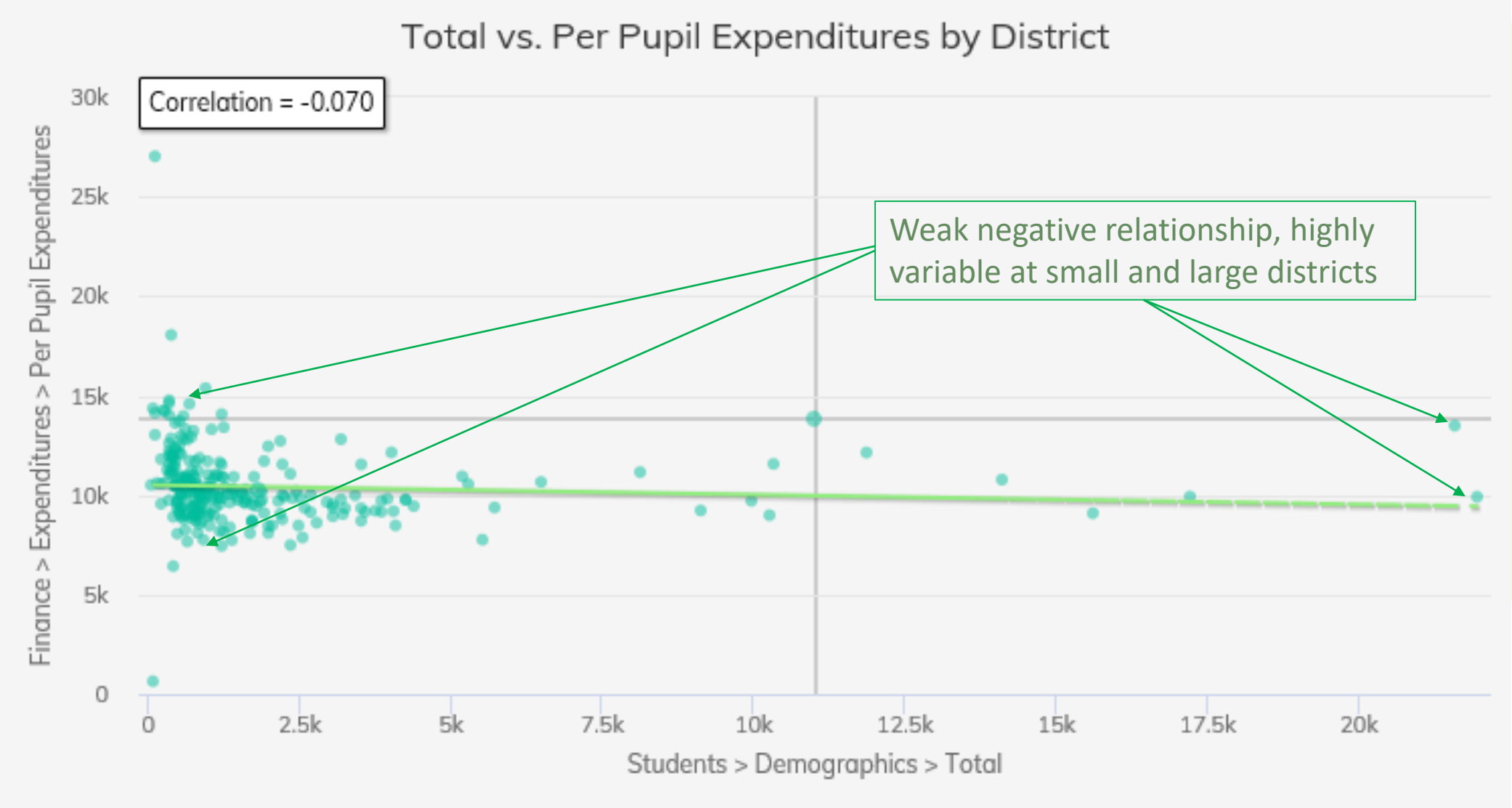
Selected Variables to Present of 100+ Analyzed

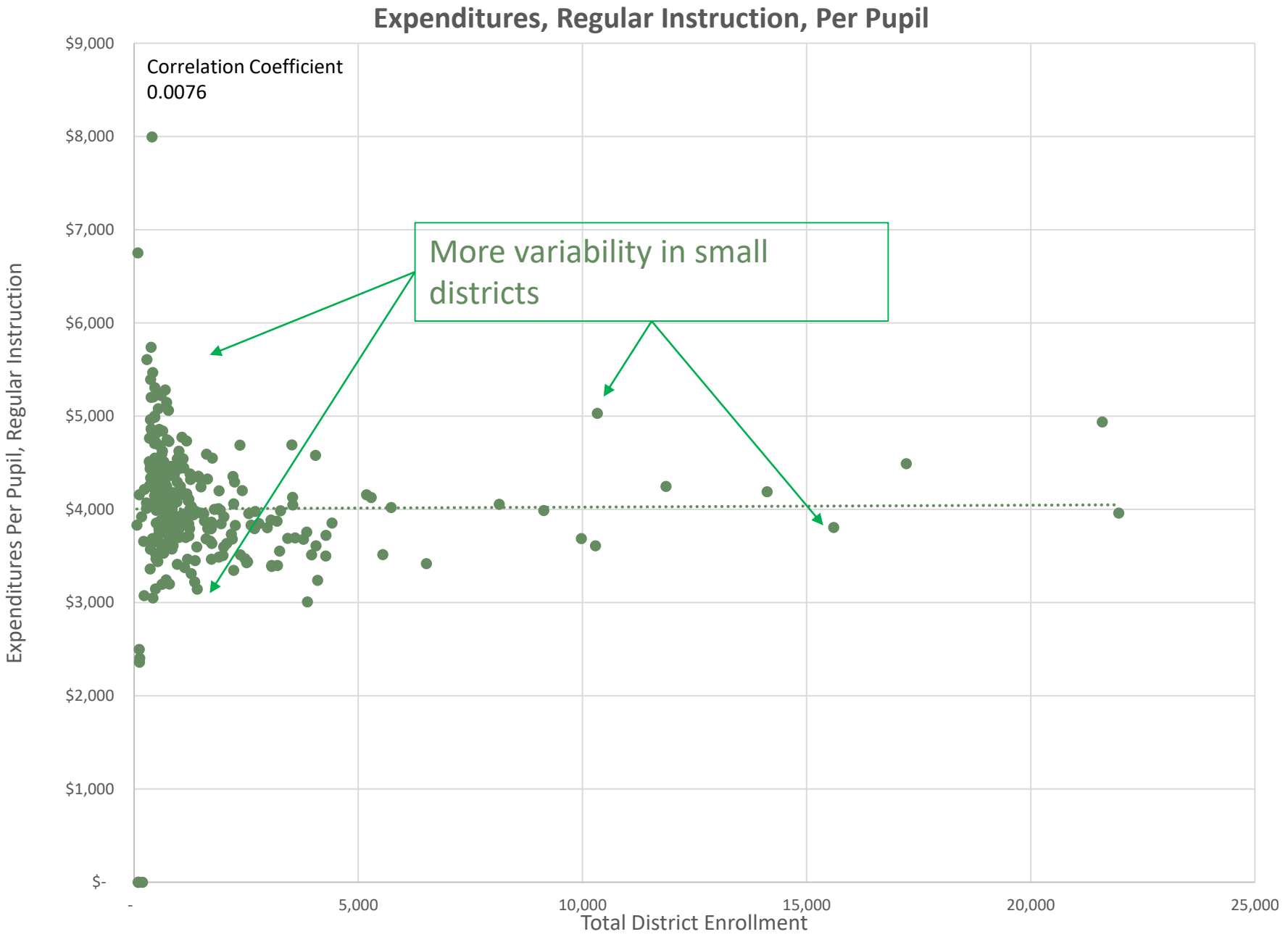
- **Operational Efficiency**
  - Total cost per pupil vs. total school district enrollment
  - Regular education program costs per pupil vs. district enrollment
  - District administration cost per pupil vs. district enrollment
- **Curriculum Diversity**
  - Pre-school programs
  - Advanced Placement (AP) Courses
  - Career Education Completers
    - Science, Technology, Engineering, Math
    - Transportation, Distribution, Logistics
- **Extracurricular Diversity**
  - Athletic activities
  - Non-athletic activities
- **Personnel and Workforce**
  - Average Years of Teaching Experience
  - Workforce Stability
- **Student Discipline-Infractions and Disciplinary Actions**
  - Expulsions
- **Other Variables**
  - Special Program Requirements
    - English Learners
    - Special Education

Operational Efficiency

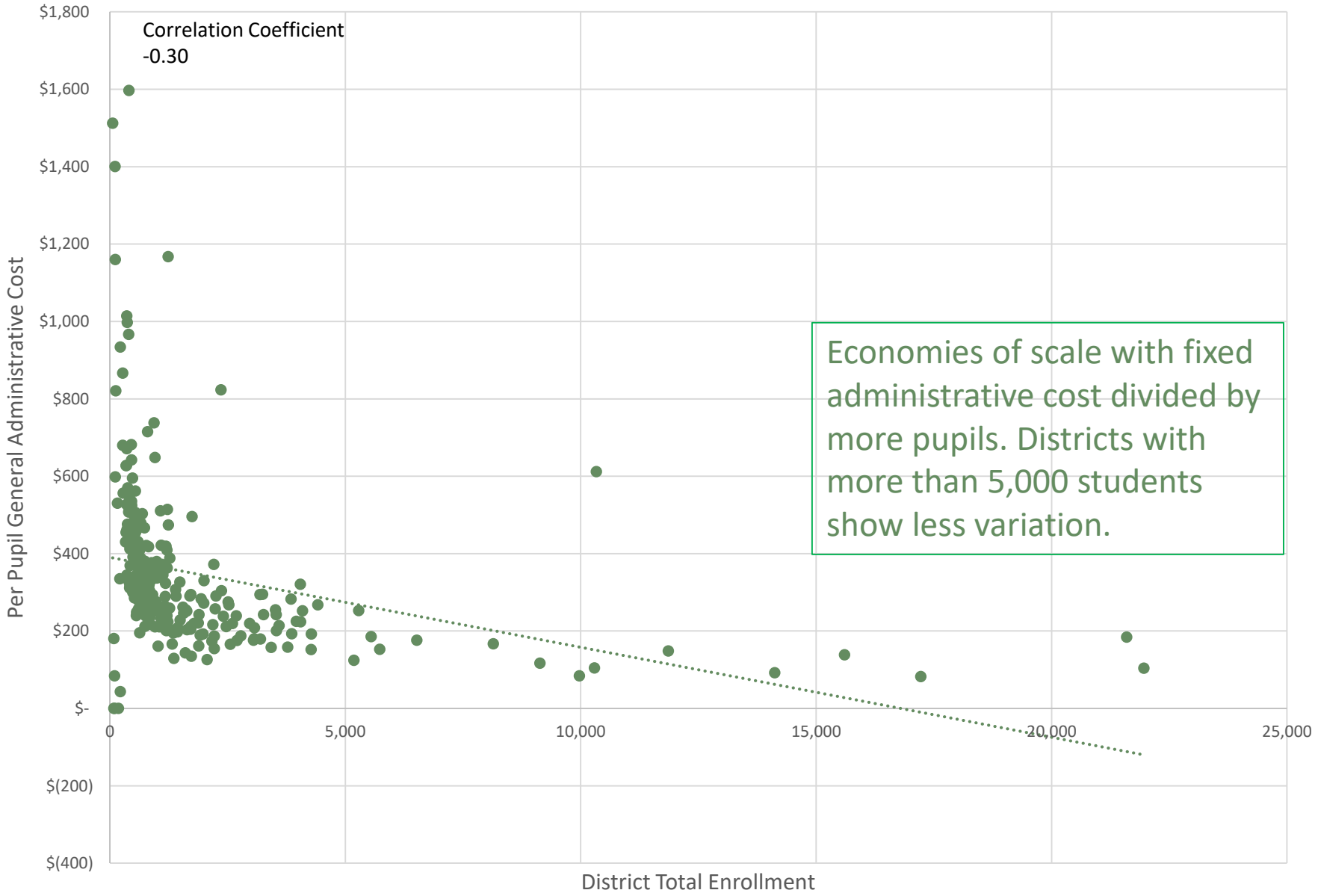
- Questions: Are larger districts more efficient operationally due to economies of scale?
- Analysis: Weak negative relationships exist for some variables for larger districts due to economies of scale. For other variables, such as special education costs, a weak positive relationship exists, possibly because of identification methods or more advocacy by parents.

Operational Efficiency – Total Expenditures Per Pupil




Expenditures, Regular Instruction, Per Pupil
Correlation Coefficient
0.0076
More variability in small districts
Expenditures Per Pupil, Regular Instruction
$9,000
$8,000
$7,000
$6,000
$5,000
$4,000
$3,000
$2,000
$1,000
$-
-
5,000
10,000
15,000
20,000
25,000
Total District Enrollment

Expenditures, General Administrative, Per Pupil



Summary Table – Operational Efficiency Per Pupil Cost vs. District Enrollment

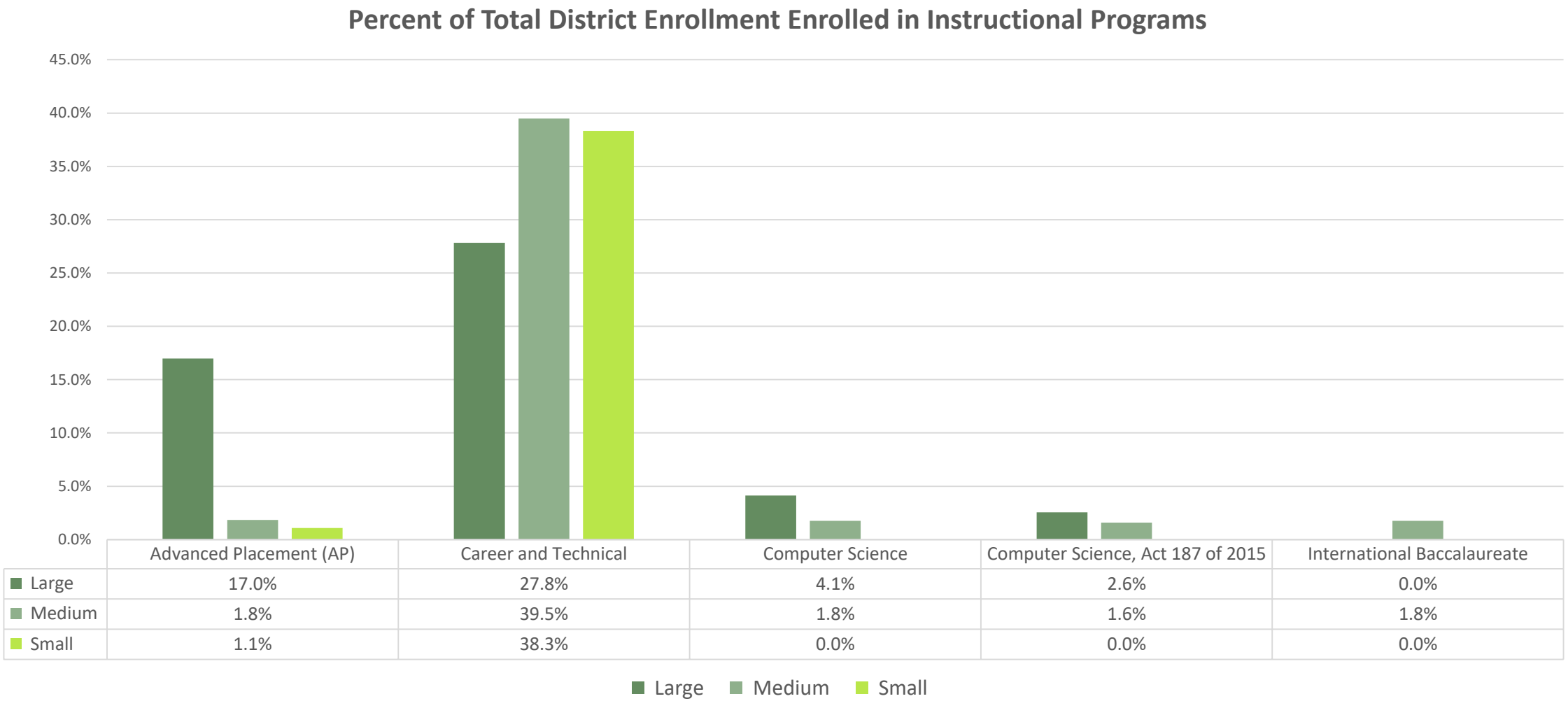
Variable	Correlation Coefficient	Strength of Relationship	Analysis, Possible Reasons
District Total Per Pupil Cost	-0.07	Very weak relationship, negative	Minimal economies of scale
Regular Instruction Cost	0.01	Very weak relationship, positive	Savings from teacher utilization offset by higher salaries
Transportation Cost	-0.07	Very weak relationship, negative	Minimal economies of scale
Special Education Cost - Total District Cost Special Education/Total District Enrollment	0.25	Weak relationship, positive	Identification methods, advocacy by parents for identification and services
General Administrative Cost	-0.30	Weak relationship, negative	Economies of scale
Non-instructional cost	-0.09	Very weak relationship, negative	Minimal economies of scale

Curriculum Diversity

- Question: Do larger districts offer a more comprehensive and diverse curriculum? For example, in:
  - Pre-school programs, Career Education programs, Advanced Placement (AP) programs, International Baccalaureate (IB) programs, specialized computer science programs

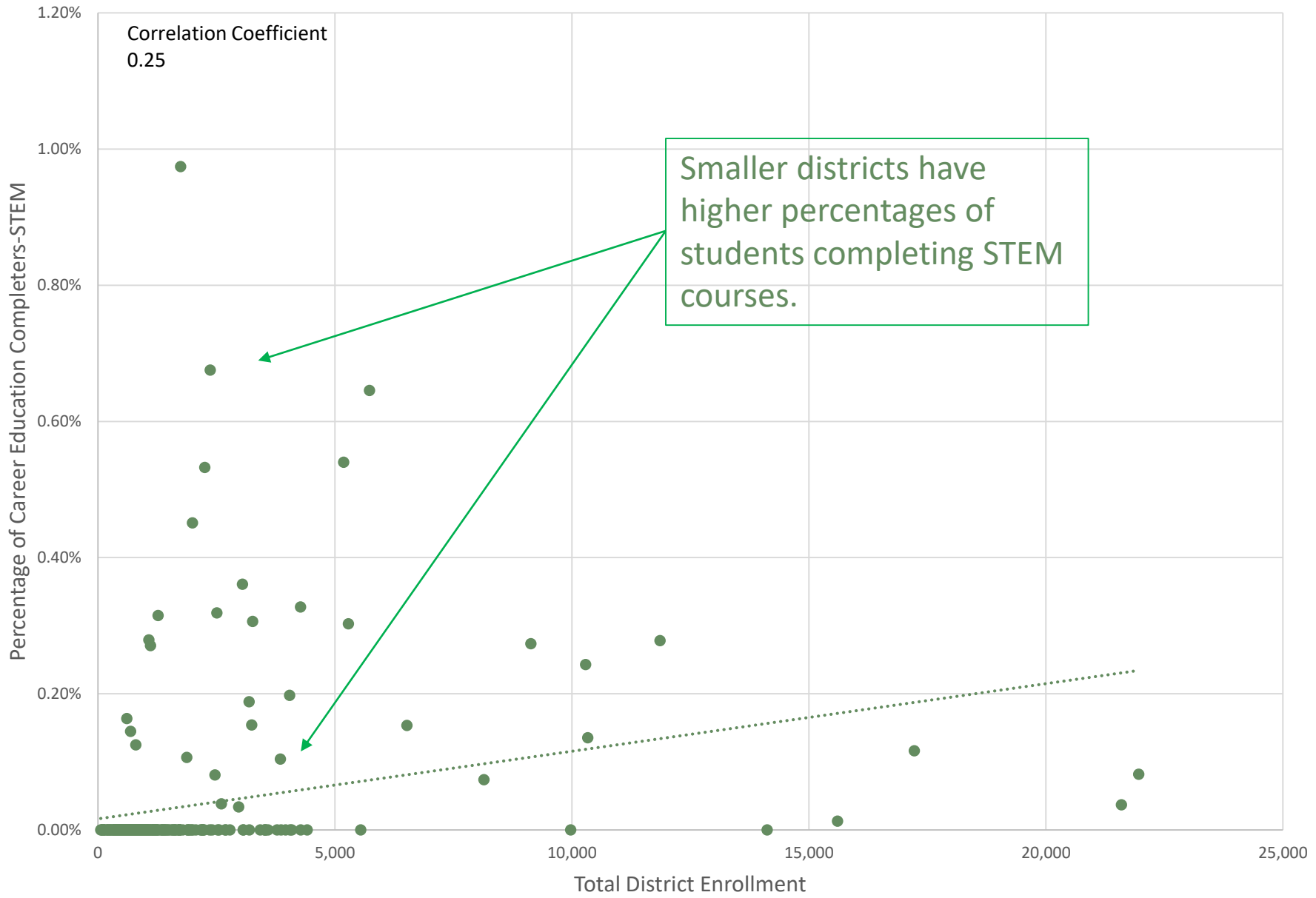
- Analysis: Although there is a weak positive relationship for larger districts offering more programs, the data show many small districts with high percentages of diverse curriculum

Instructional Program Participation – 3 Sample Districts: Large (21,595 students), Medium (3,532 students), Small (553 students)

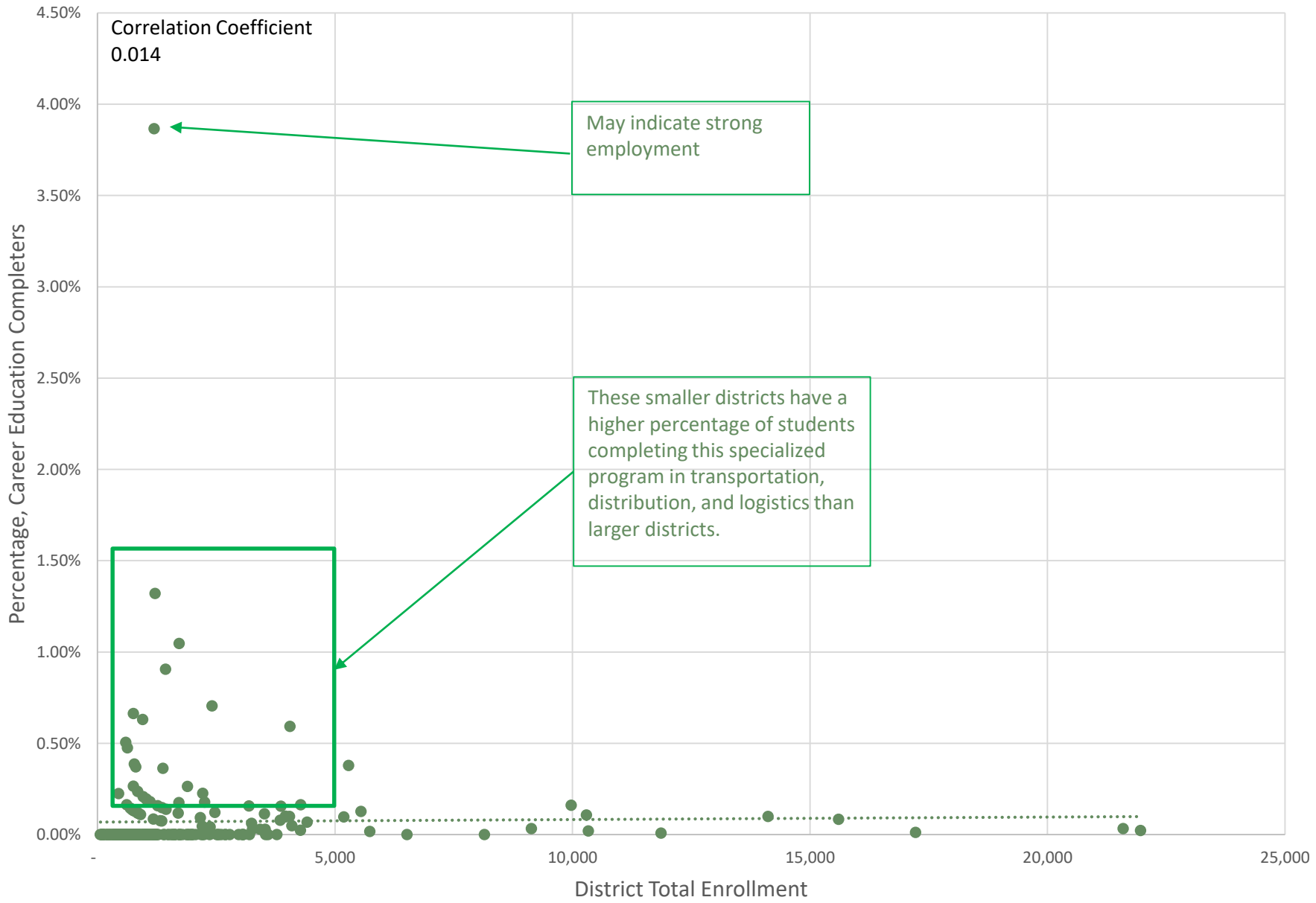


	Advanced Placement (AP)	Career and Technical	Computer Science	Computer Science, Act 187 of 2015	International Baccalaureate
Large	17.0%	27.8%	4.1%	2.6%	0.0%
Medium	1.8%	39.5%	1.8%	1.6%	1.8%
Small	1.1%	38.3%	0.0%	0.0%	0.0%

Percentage of Career Education Completers-STEM (Science, Technology, Engineering, Math)



Percentage Career Education Completers-Transportation, Distribution, Logistics

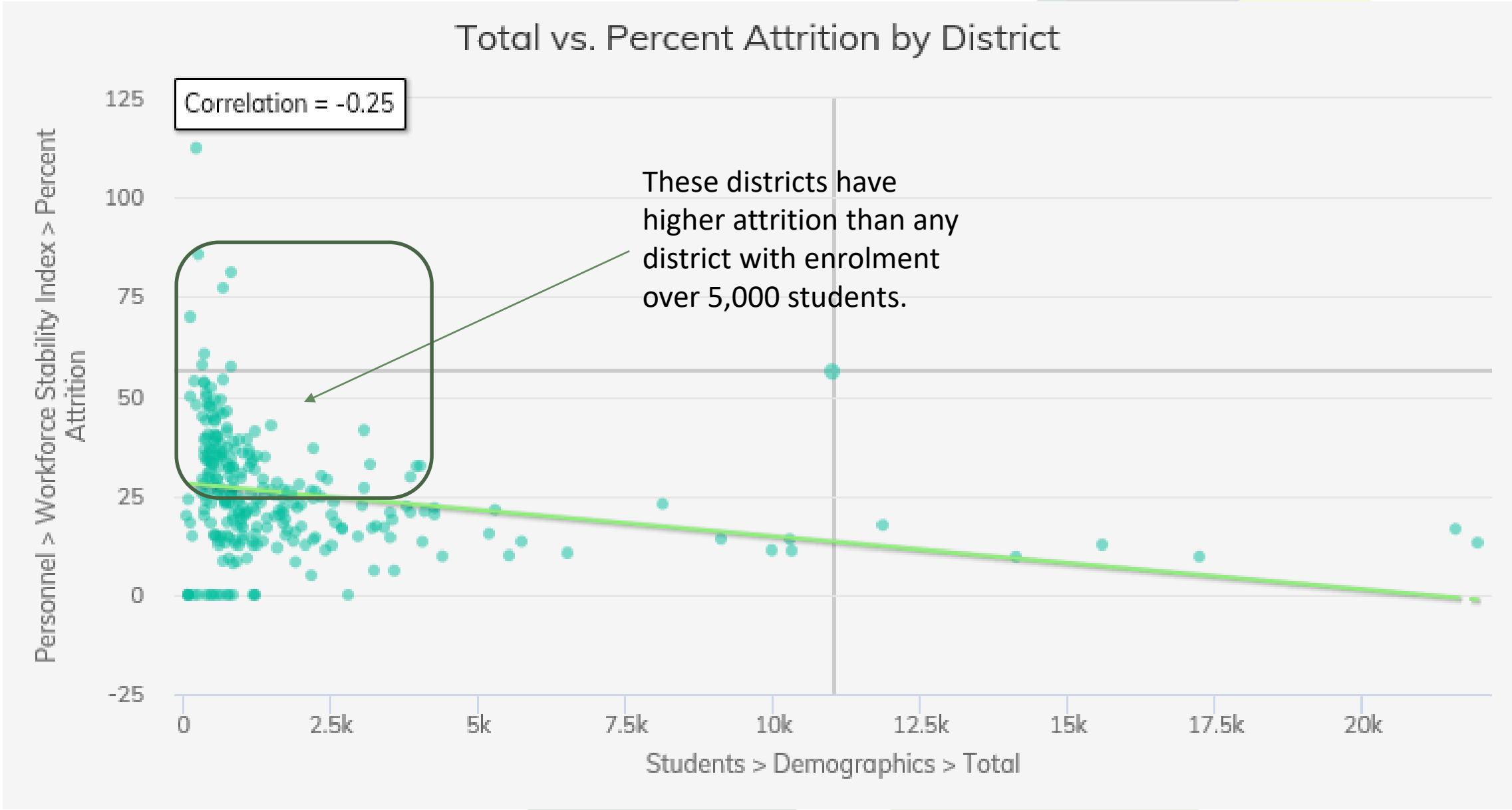


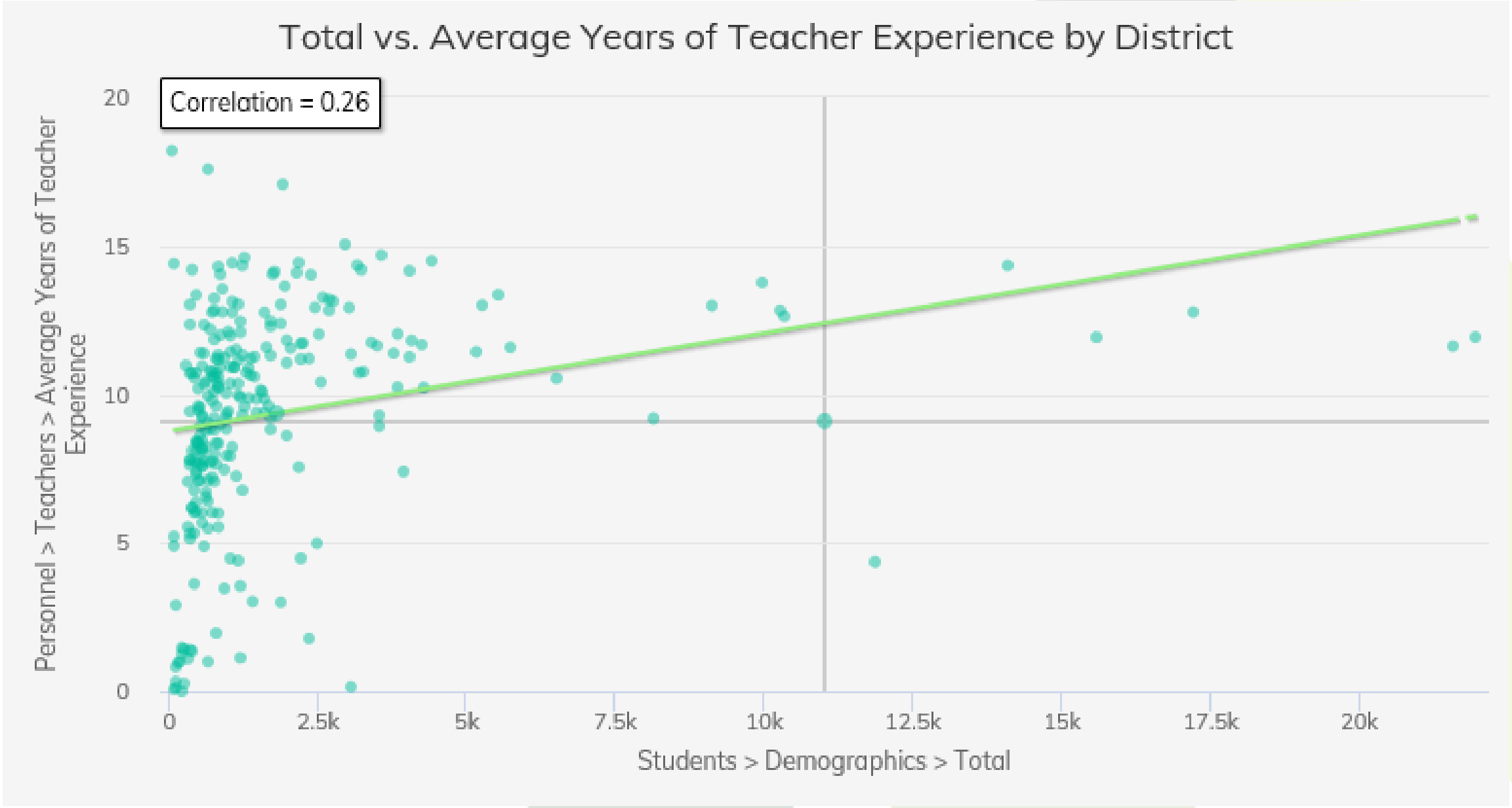
Summary Table – Curriculum Diversity Courses Offered vs. District Enrollment

Variable	Correlation Coefficient	Strength of Relationship	Analysis, Possible Reasons
Career Education Completers			
STEM-% of Total District Students	0.25	Weak relationship, positive	Small districts can provide diverse curriculum
Transportation, Distribution, Logistics-% of Total District Students	0.014	Very weak relationship, positive	
Health Sciences	0.11	Weak relationship, positive	
Information Technology	0.064	Weak relationship, positive	
Hospitality and Tourism	0.09	Weak relationship, positive	

Personnel and Workforce

- Question: Do larger districts attract and retain more highly trained staff?
- Analysis: Examined four variables and found weak positive relationships on most, the workforce stability/attrition variable was weak but showed that larger districts have less attrition


Total vs. Percent Attrition by District
Correlation = -0.25
These districts have higher attrition than any district with enrolment over 5,000 students.
Personnel > Workforce Stability Index > Percent Attrition
125
100
75
50
25
0
-25
0
2.5k
5k
7.5k
10k
12.5k
15k
17.5k
20k
Students > Demographics > Total

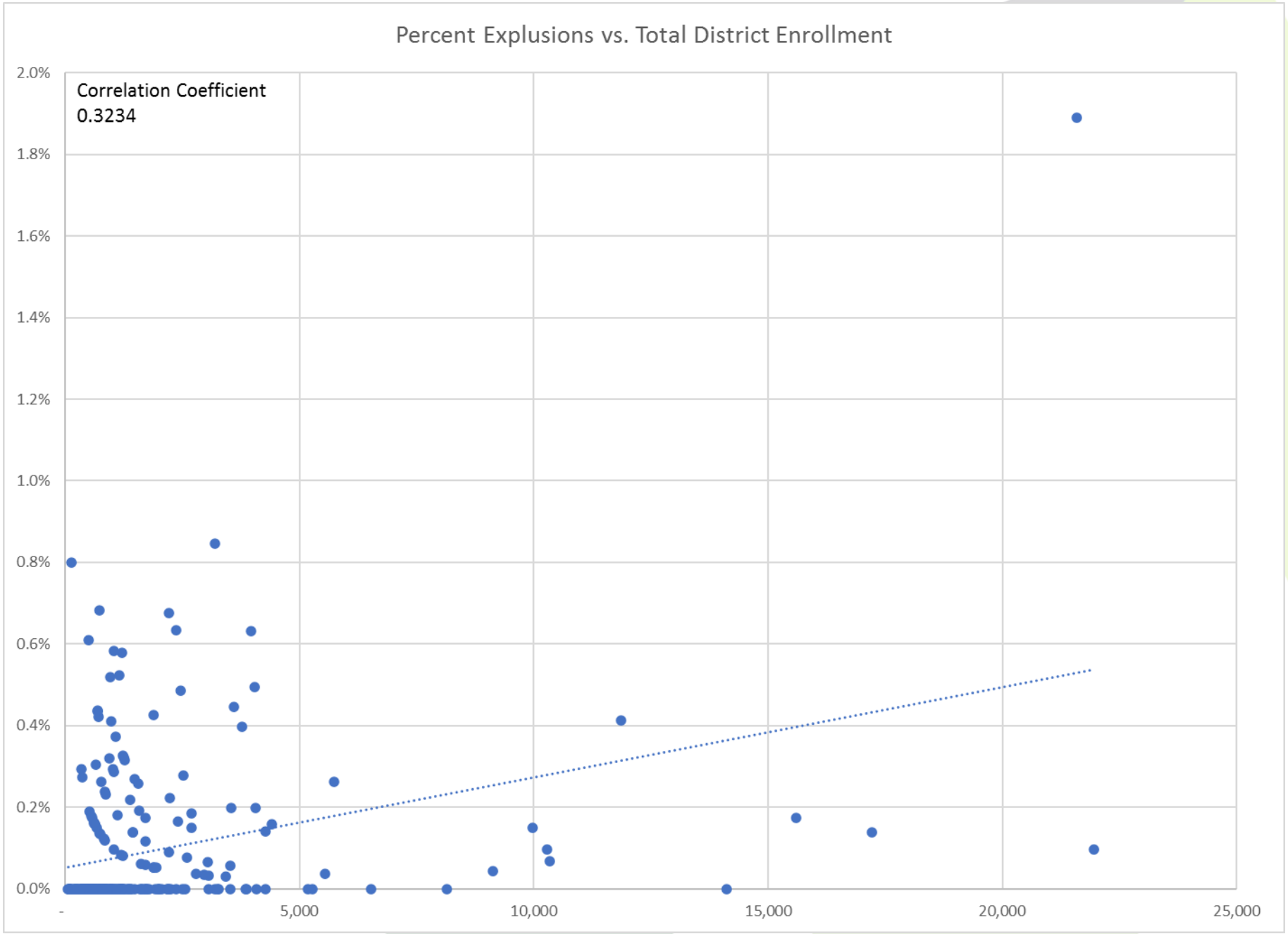

Total vs. Average Years of Teacher Experience by District
Correlation = 0.26
Personnel > Teachers > Average Years of Teacher Experience
20
15
10
5
0
0
2.5k
5k
7.5k
10k
12.5k
15k
17.5k
20k
Students > Demographics > Total

Summary Table – Personnel and Workforce

Variable	Correlation Coefficient	Strength of Analysis	Analysis, Possible Reasons
Average Years Teaching Experience	0.26	Weak, positive	Lower turnover due to higher pay in mid-career
% Teachers Completely Certified (licensed)	0.10	Very weak, positive	
Teachers with Advanced Degrees	0.19	Weak, positive	Better compensation for advanced degrees
Percent Attrition, Workforce Stability Index	-0.25	Weak, negative	Smaller districts have higher turnover for many reasons

Student Discipline – Infractions and Disciplinary Actions

- Questions: Does the size of district impact the incidence of behavioral issues?
- Analysis: Examined eight variables and found a general positive relationship between larger districts and higher incidences. Most of the relationships were weak.

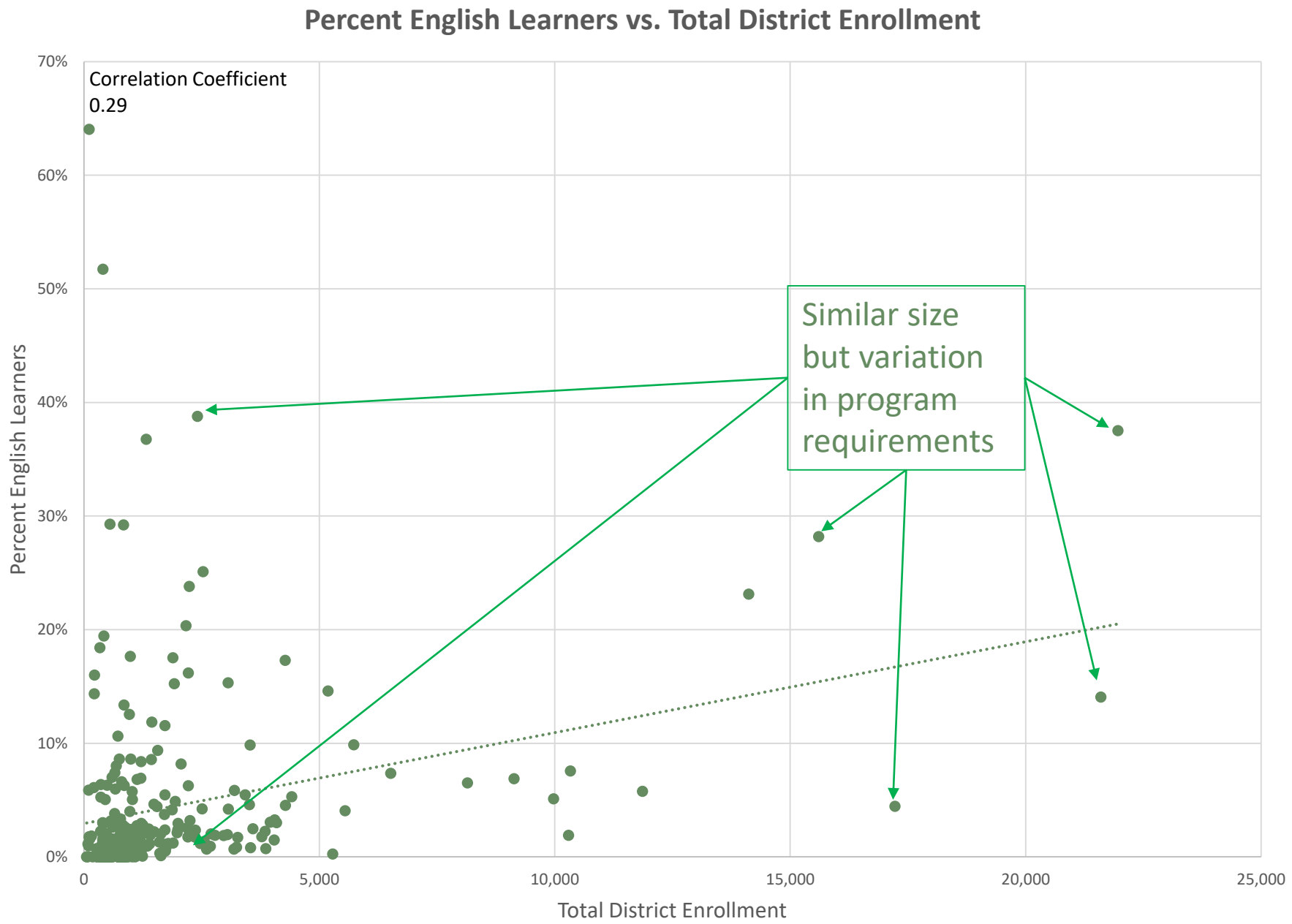

Percent Explusions vs. Total District Enrollment
Correlation Coefficient
0.3234
2.0%
1.8%
1.6%
1.4%
1.2%
1.0%
0.8%
0.6%
0.4%
0.2%
0.0%
-
5,000
10,000
15,000
20,000
25,000

Summary Table – Student Discipline

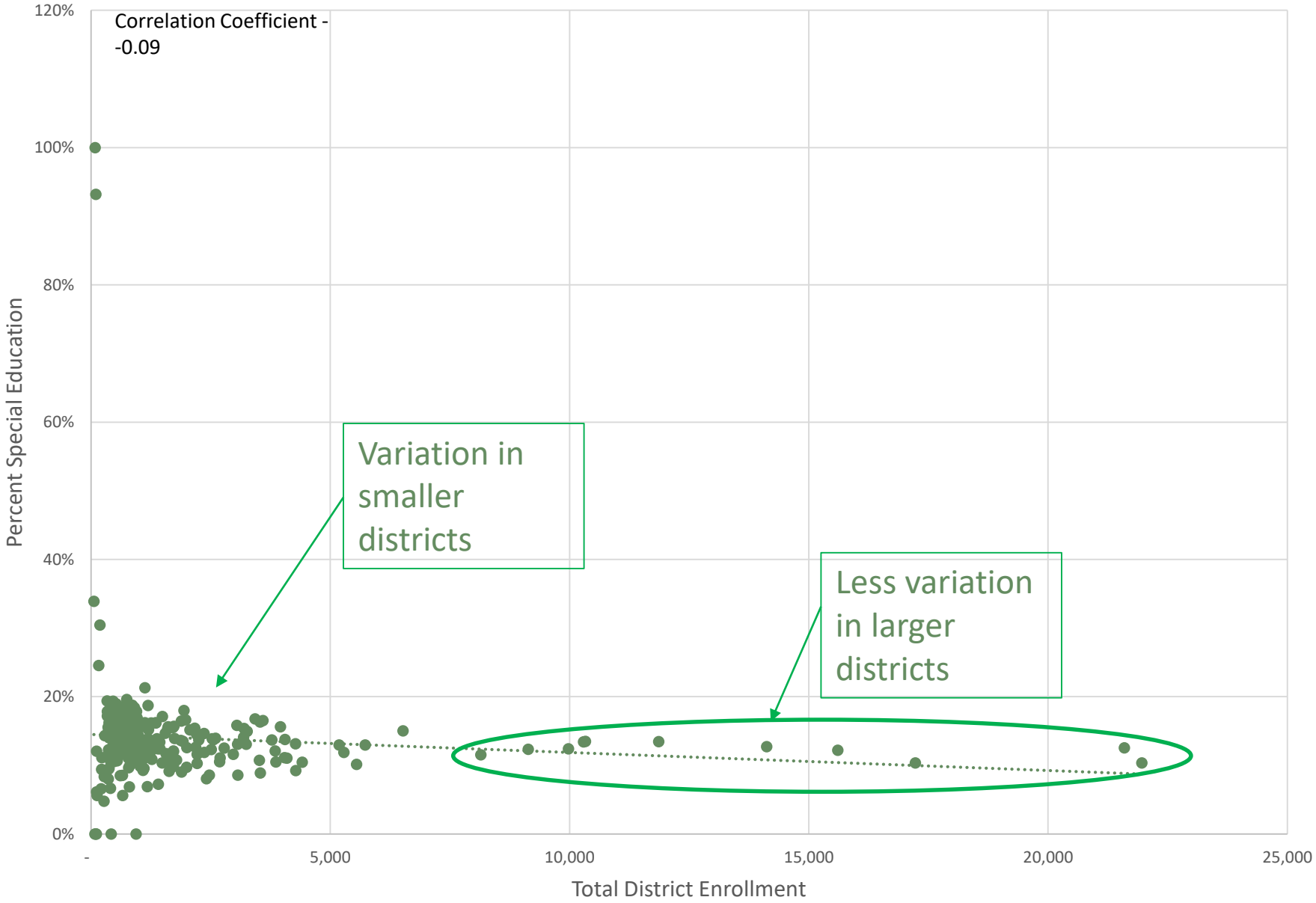
Variable	Correlation Coefficient	Strength of Analysis	Analysis, Possible Reasons
Disciplinary Infractions			
Bullying	-0.063	Very weak, negative	
Staff Assaults	0.64	Moderate, positive	More incidents or bigger district staff trained to report
Fighting	-0.013	Very weak, negative	
Vandalism	0.015	Very weak, positive	
Disciplinary Actions per 100 pupils			
Expulsion	0.12	Weak, positive	
In School Suspension	0.00049	None	
Out of School Suspension	0.078	Very weak, positive	
Exclusionary Discipline	0.089	Very weak, positive	

Specialized Program Requirements

- Specialized program requirements differ by district size based on the characteristics of the community in each school district
  - English learners
  - Special education students
  - Handicapped students
  - Homeless students
  - Migrant students
  - Gifted and talented students


Percent English Learners vs. Total District Enrollment
Correlation Coefficient
0.29
Similar size
but variation
in program
requirements
70%
60%
50%
40%
30%
20%
10%
0%
Percent English Learners
0
5,000
10,000
15,000
20,000
25,000
Total District Enrollment

Percent Special Education vs. Total District Enrollment



Summary Table – Specialized Program Requirements

Variable	Correlation Coefficient	Strength of Analysis	Analysis, Possible Reasons
English Learners, %	0.29	Weak, positive	New immigrants in larger population centers
Special Education, %	-0.09	Very weak, negative	
Handicapped	-0.025	Very weak, negative	
Homeless	0.58	Moderate, positive	Large urban areas with poverty have more homeless students
Migrants	-0.064	Very weak, negative	
Gifted and Talented, %	0.1	Very weak, positive	

District Size Conclusions

- Economies of scale resulted in some negative relationships for operational efficiency due to large districts having lower costs
- For most variables, small districts showed little impact due to district size, meaning that small districts can offer strong programs and opportunities for students

School Size

Research on School Size- National Research

- **Operational Efficiency**
  - In some studies, operational efficiency, measured by cost per student, has been found to increase to an optimal enrollment, then remain constant, eventually increasing as enrollment increases (Slate & Jones, 2005). Possible reasons:
  - More students allow better utilization of staffing in regular classrooms and small group programs. For example, in a small school with 30 students per grade level, two teachers are required because 30 students/teacher is too high. In a school twice as large with 60 students per grade level, three teachers can result in 20 students/teacher, an acceptable ratio, rather than four teachers.
  - Population density is an important factor because low density can greatly increase costs of transporting students. (Fox, 1980,1981)

Research on School Size- National Research (continued)

- **Curricular Diversity**
  - Large schools often add more sections of the same course, not more courses. Small schools provide broader learning experiences than published course offerings suggest. (Unks, 1989)
  - Relationship between school size and curricular diversity begins to decrease with enrollments above 400 students (Monk, 1987); relatively small high schools may provide as diverse a curriculum, taught in general courses rather than more specialized courses.
  - Online offerings will continue to expand opportunities.

Research on School Size- National Research (continued)

- **Extracurricular Diversity**
  - While larger schools may offer more programs, smaller schools often have higher participation
- **Student Achievement**
  - Student achievement is related to many factors, particularly socioeconomic factors of the school community. Some studies have found no relationship between school size and academic achievement in general, but significant relationship for subgroups of learners, including students with learning disabilities and those who are socioeconomically disadvantaged. (Gershenson & Langbein, 2015)

Methodological Concerns with School Size Studies

- Large scale studies with random assignment of students are not available, meaning causal conclusions are weak at best
- Researchers are trained not to draw causal conclusions from correlational data, but decision makers are often forced to draw conclusions using the best data available
- Use of an advocacy research style due to advocating for or against consolidation (Johnston & Pennypacker, 1993)
- Weighting of each factor is a value judgment, not an empirically derived weight

Preview of General Research Findings - School Size in Arkansas

- **Operational efficiency**
  - Weak relationships between school size and per student costs
  - No clear evidence of optimal size at any grade level configuration
- **Curriculum diversity**
  - Many small schools are offering diverse curriculum
- **Extracurricular program diversity**
  - As expected, larger schools can offer more activities, both athletic and non-athletic

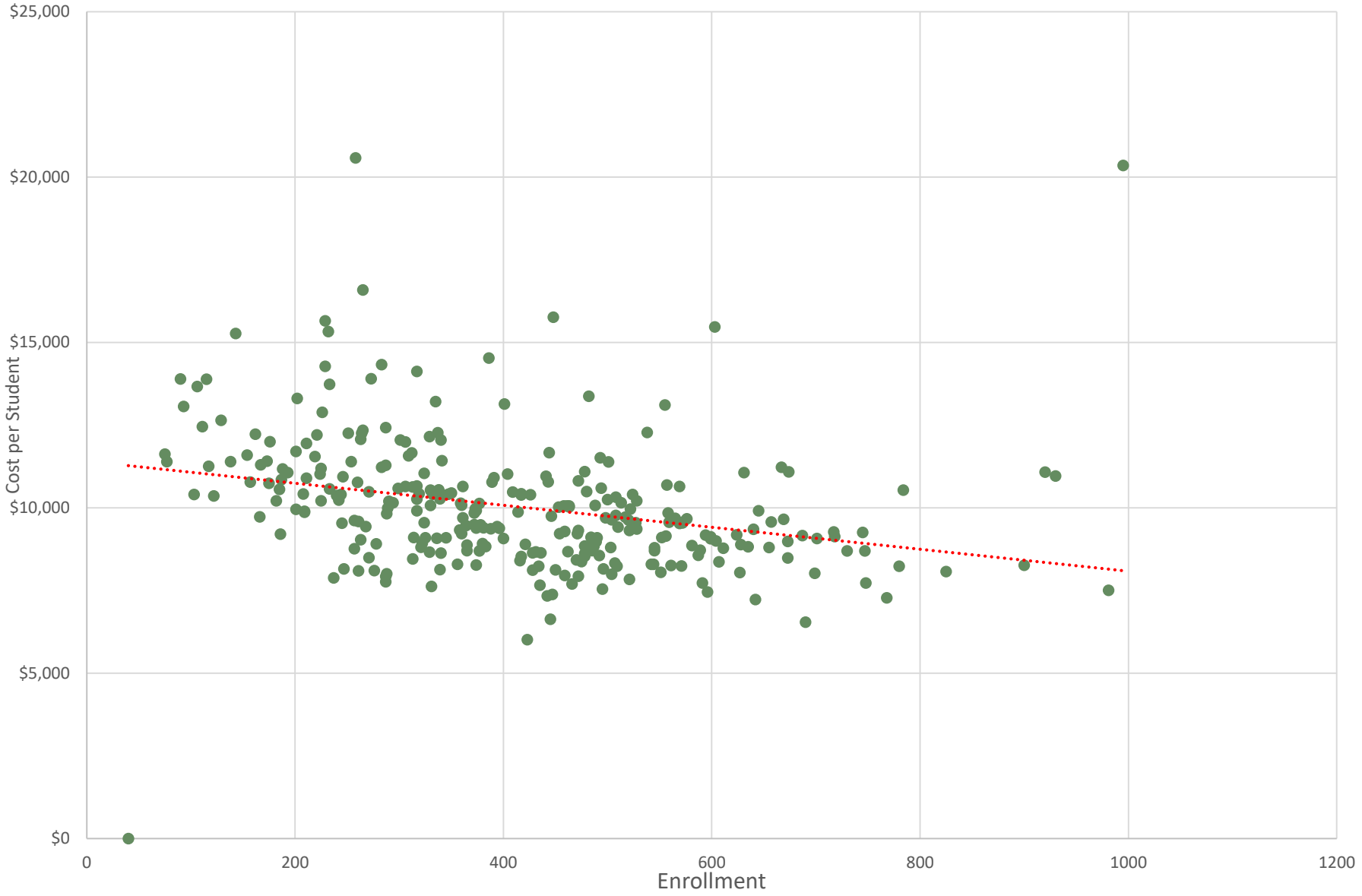
Selected Variables to Present of 100+ Analyzed

- **Operational Efficiency**
  - Total cost per student vs. school enrollment: elementary, middle, and high schools
  - School administration cost vs. school enrollment
- **Curriculum Diversity**
  - Advanced Placement courses taken
  - Career Education Completers, Health
- **Extracurricular Diversity**
  - Preliminary analysis of data from Arkansas Activities Association - athletic and non-athletic activities
- **Academic Achievement**
  - ACT Aspire: Meets/Exceeds Standards, Literacy
  - Value Added, Math
  - AP Tests Scored 3,4,5
  - Graduation rates
- **Other – potentially useful for program analysis**
  - Average Years Teacher Experience
  - Teacher Completely Certified (licensed)
  - Disciplinary – Exclusion

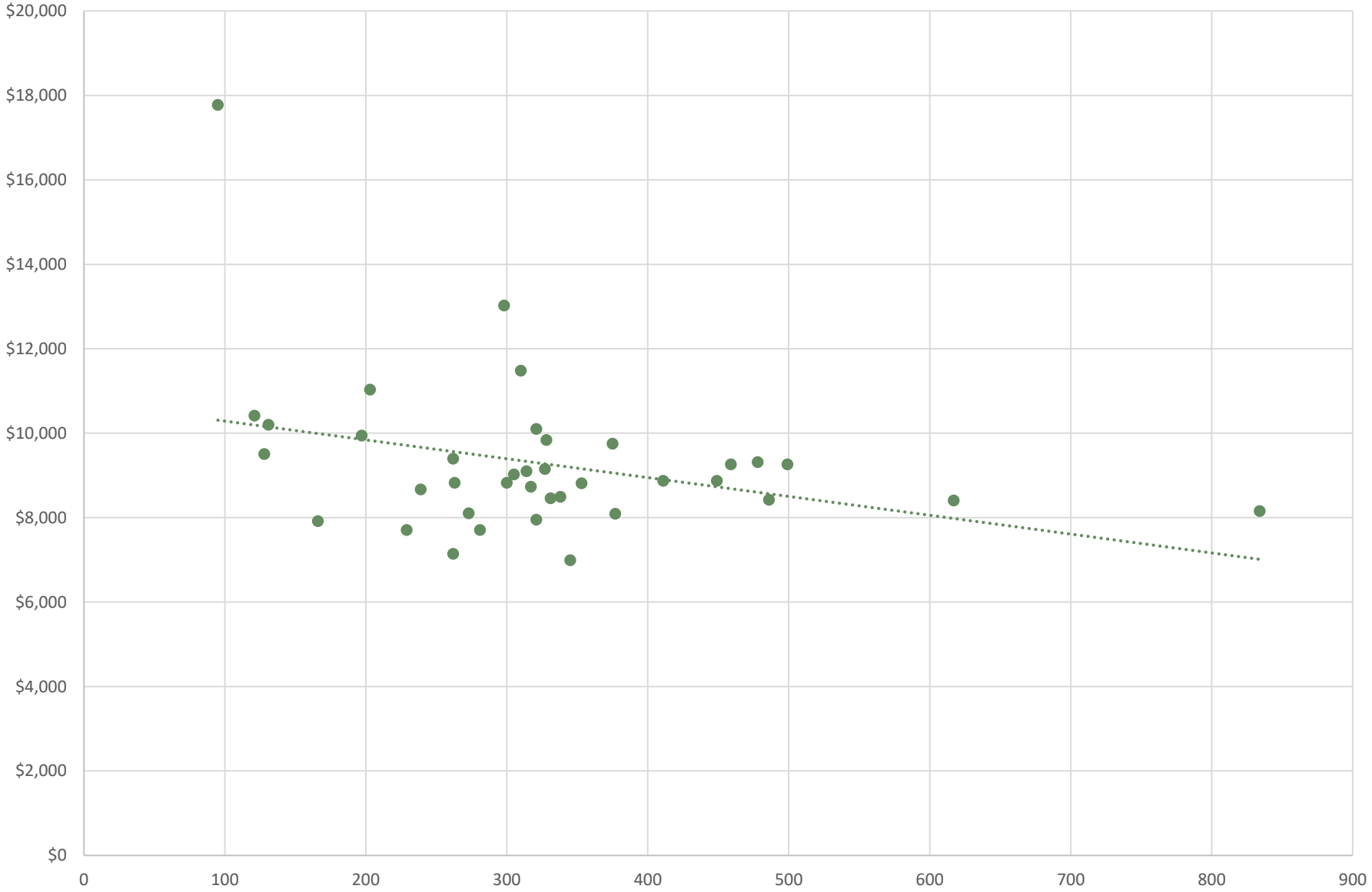
Operational Efficiency Expenditures per Pupil

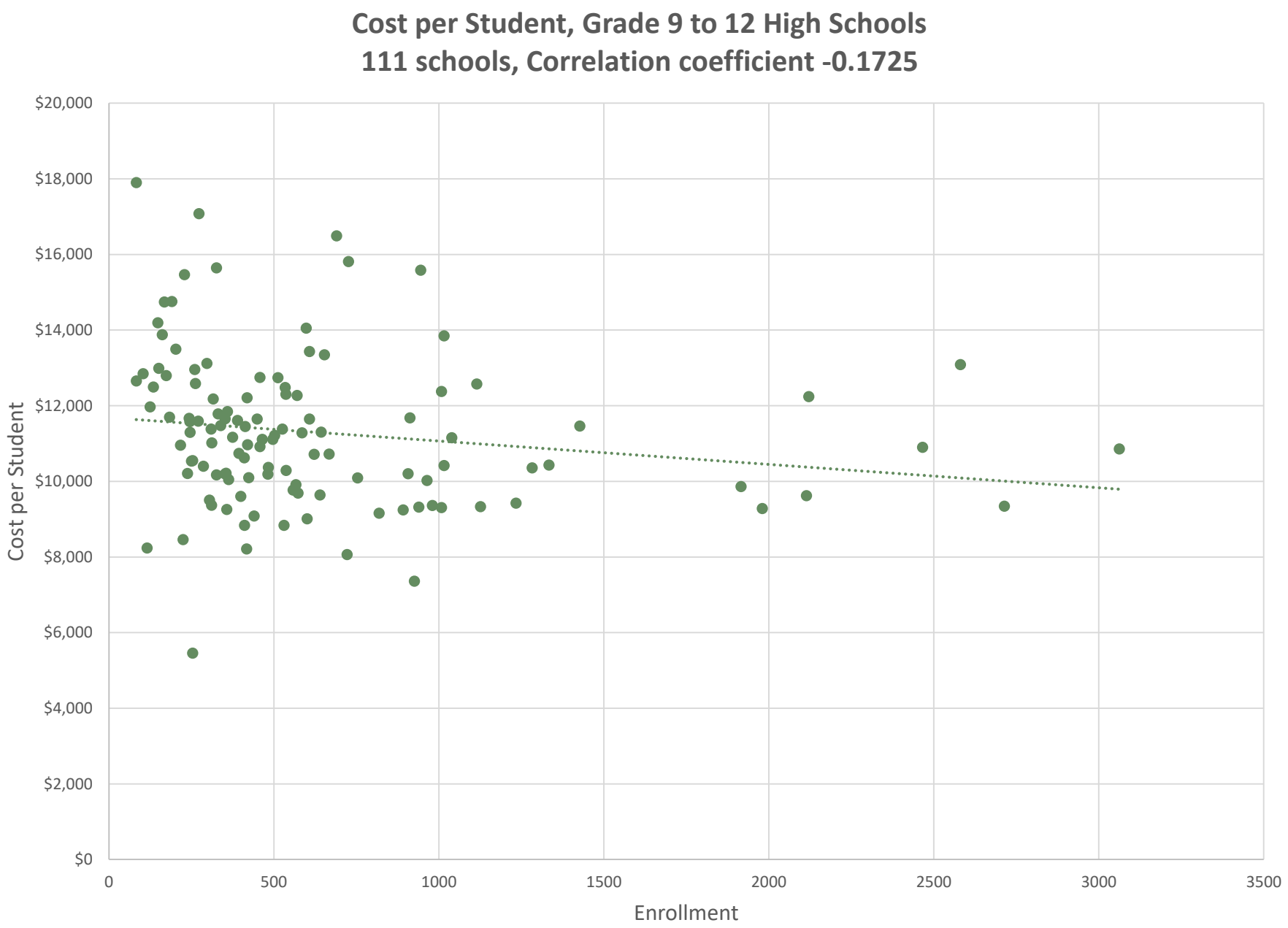
- Question: What is the relationship between school size and expenditures per pupil at the school level?
- Analysis: Examined expenditures per pupil by different grade spans
  - Weak relationships between school size and per student costs
  - No clear evidence of optimal size at any grade level configuration

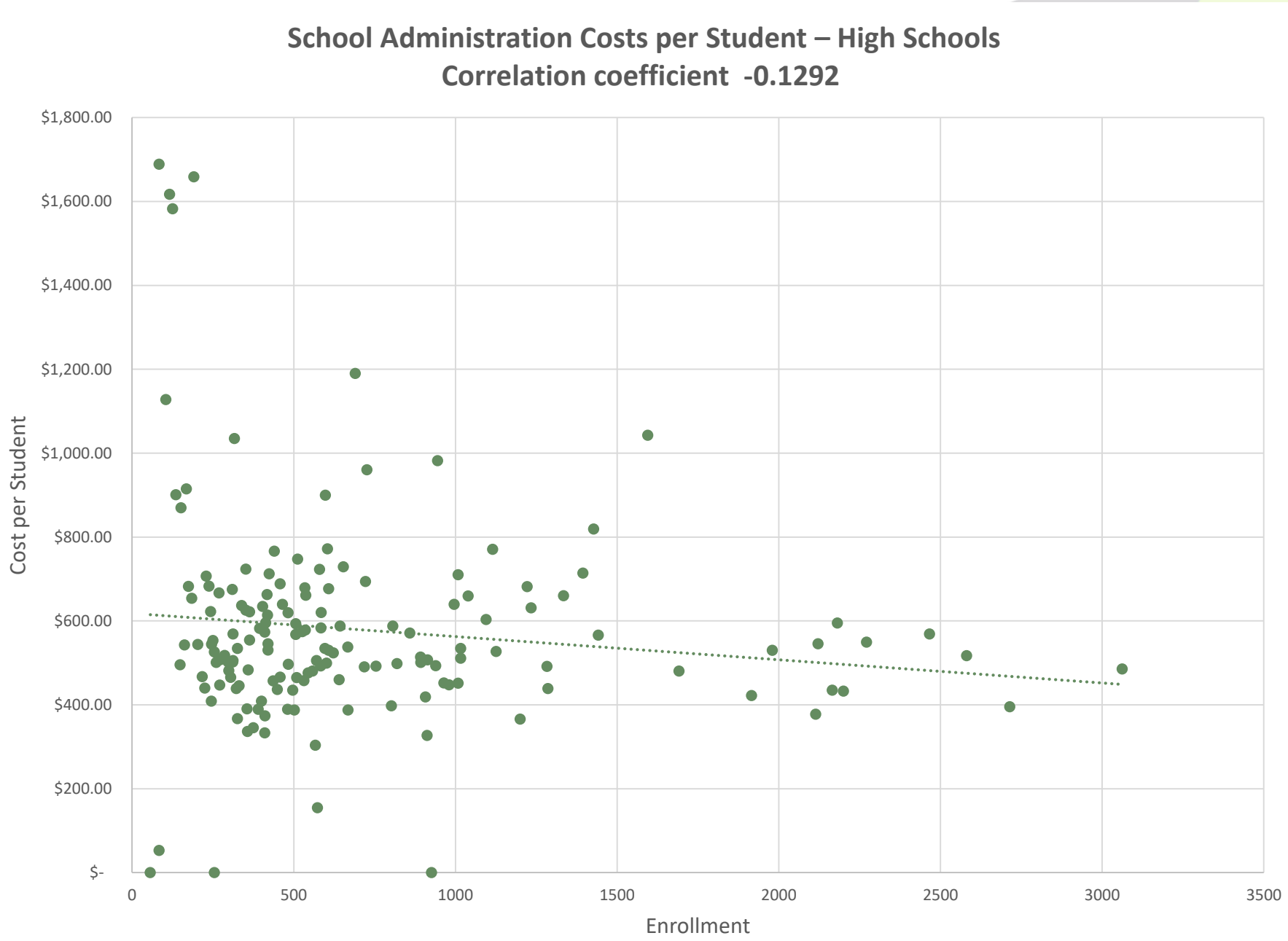
Cost per Student – Elementary: K-4, K-5, K-6
300 Schools, Correlation coefficient -0.2868



Cost per Student – Grade 5 to 8 Middle Schools
38 schools, Correlation coefficient -0.3416




Cost per Student, Grade 9 to 12 High Schools
111 schools, Correlation coefficient -0.1725
$20,000
$18,000
$16,000
$14,000
$12,000
$10,000
$8,000
$6,000
$4,000
$2,000
$0
Cost per Student
0
500
1000
1500
2000
2500
3000
3500
Enrollment

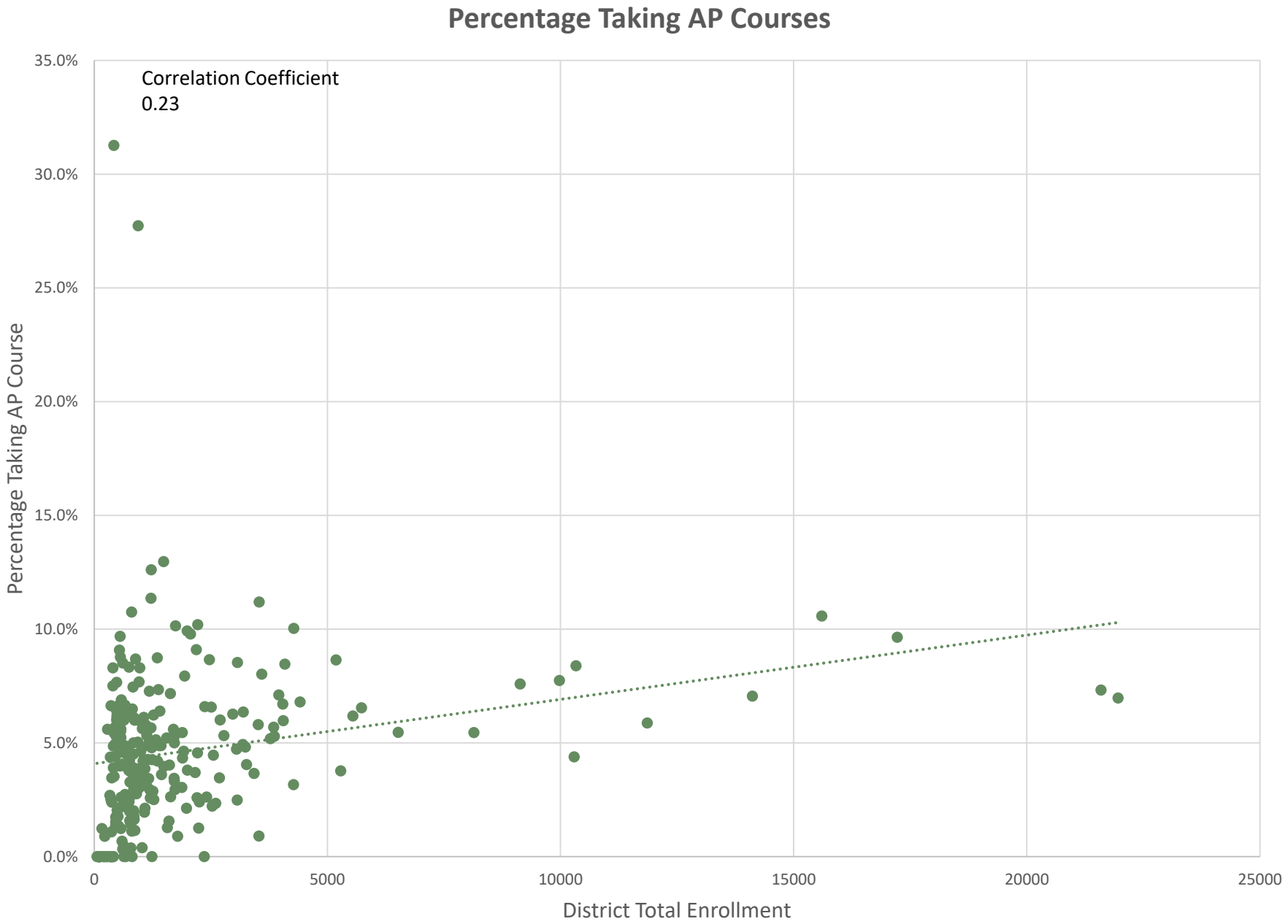

School Administration Costs per Student – High Schools
Correlation coefficient -0.1292
$1,800.00
$1,600.00
$1,400.00
$1,200.00
$1,000.00
$800.00
$600.00
$400.00
$200.00
$-
Cost per Student
0
500
1000
1500
2000
2500
3000
3500
Enrollment

Summary Table – School Spending

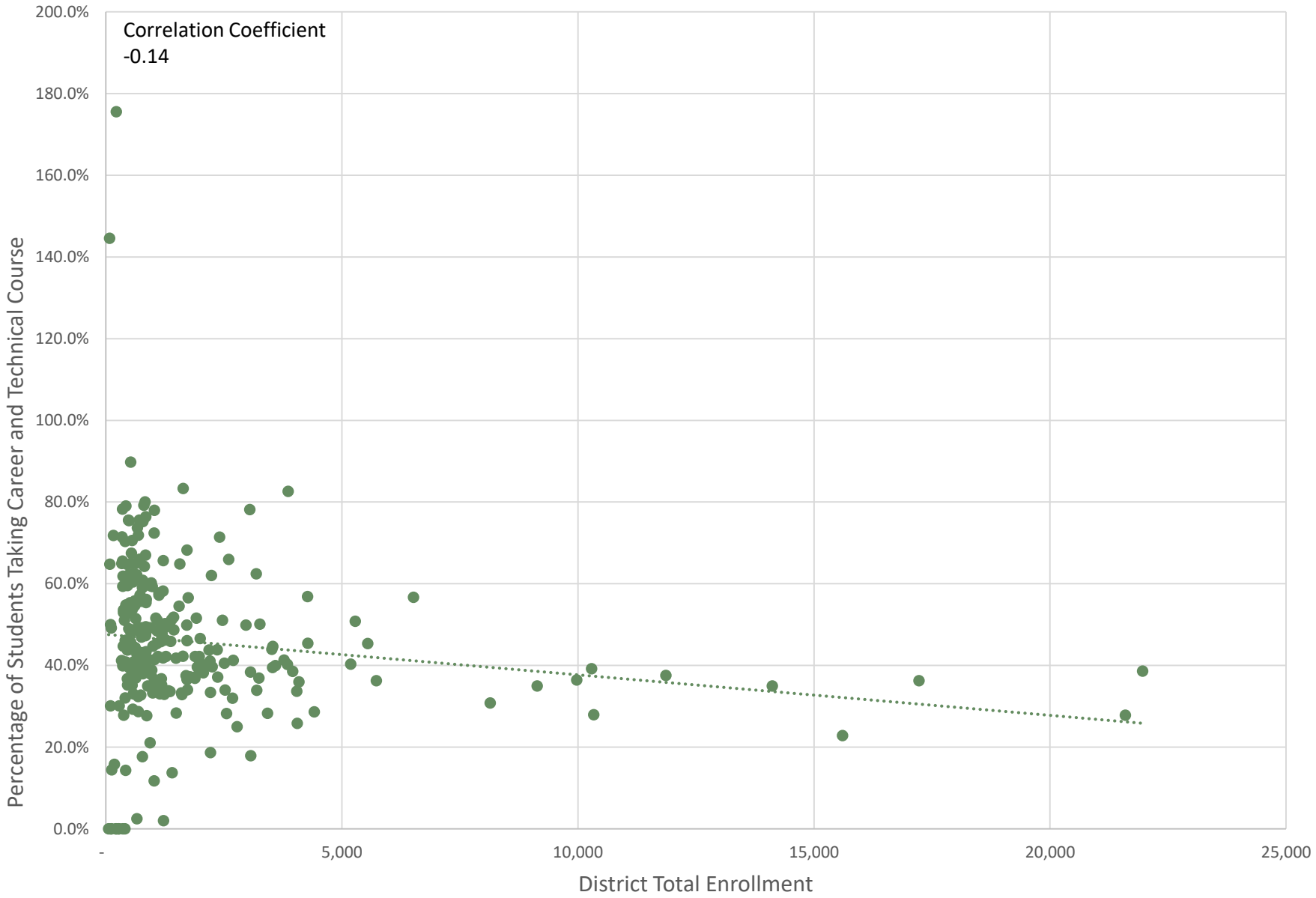
Variable	Correlation Coefficient	Strength of Relationship	Analysis, Possible Reasons
Elementary, K-4, K-5, K-6 (300 schools)	-0.29	Weak relationship, negative	Economies of scale
Middle - Grades 5-8 (38 schools)	-0.34	Weak relationship, negative	Economies of scale
Middle - Grades 6-8 (60 schools)	-0.0025	Very weak relationship, negative	
High School - Grades 7-12 (116 schools)	-0.35	Weak relationship, negative	Economies of scale
High School - Grades 9-12 (111 schools)	-0.17	Weak relationship, negative	
All High Schools	-0.13	Weak relationship, negative	
School Administrative Costs, Per Pupil, High Schools	-0.13	Weak relationship, negative	

Curriculum Diversity

- Question: Does the size of school impact the availability of course/program offerings for students?
- Analysis: Examined the percentage of students taking and/or completing courses/programs. Many small schools are offering diverse curriculum.


Percentage Taking AP Courses
Correlation Coefficient
0.23
35.0%
30.0%
25.0%
20.0%
15.0%
10.0%
5.0%
0.0%
Percentage Taking AP Course
0
5000
10000
15000
20000
25000
District Total Enrollment

Percentage of Students Taking Career and Technical Courses

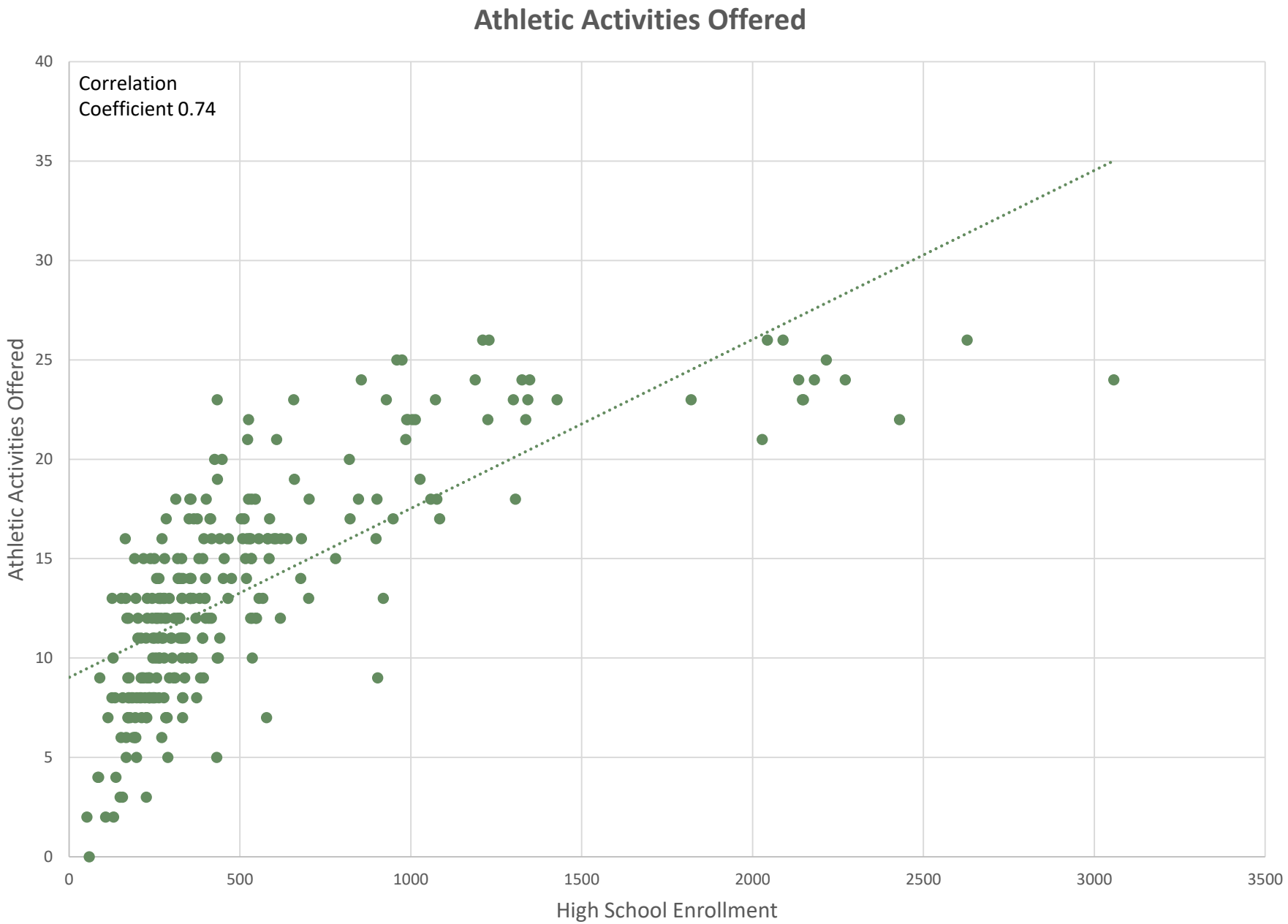


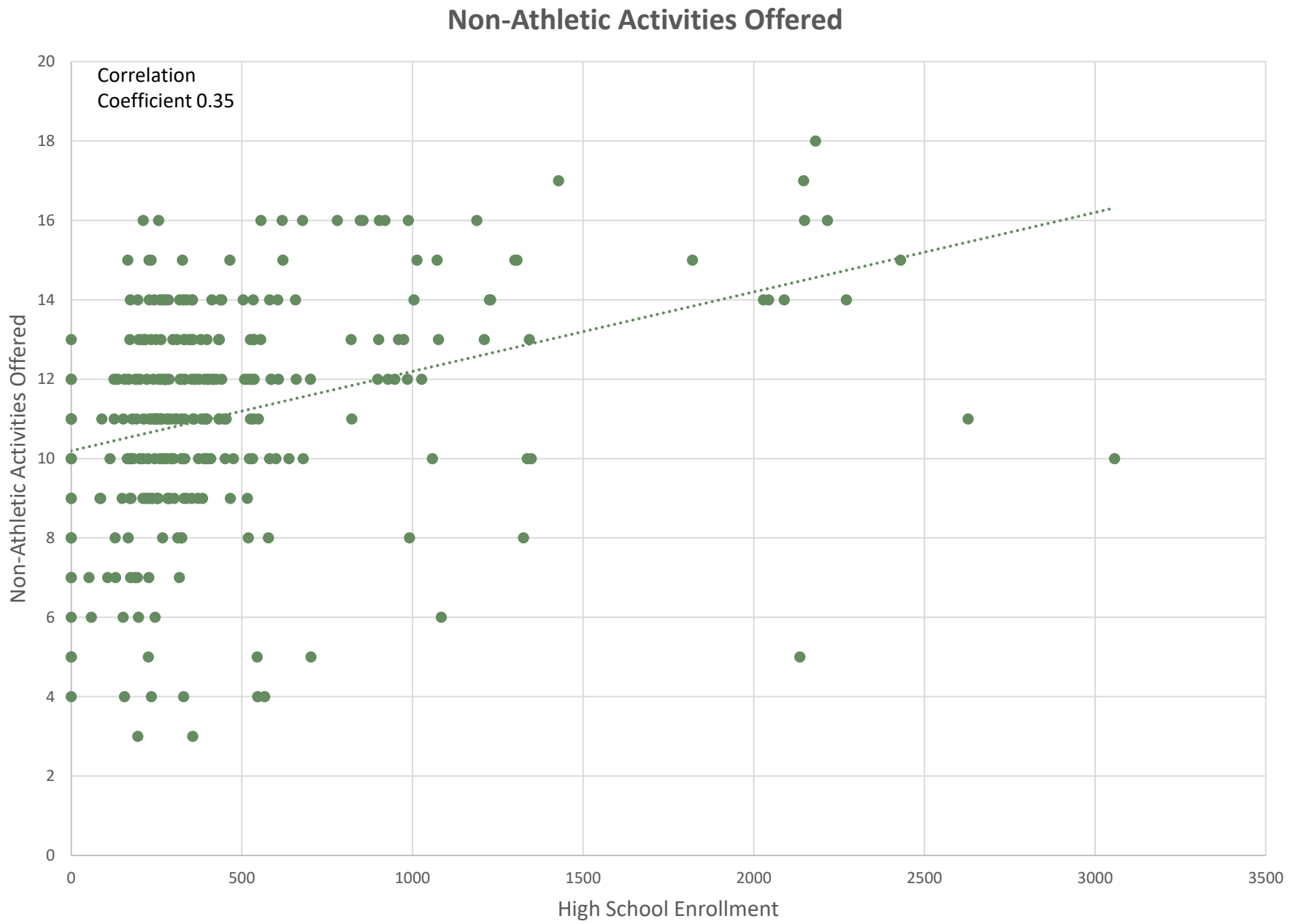
Summary Table- Curricular Diversity vs. Enrollment

Variable	Correlation Coefficient	Strength of Relationship	Analysis, Possible Reasons
Percentage of Students Taking AP Courses	0.23	Weak, positive	Small districts offer diverse curriculum
Percentage of Students Taking Career and Technical Courses	-0.14	Weak, negative	
Percentage Career Education Completers-Health Sciences	0.11	Weak, positive	Small districts offer diverse curriculum
Percentage Career Education Completers-Information Technology	0.064	Very weak, positive	Small districts offer diverse curriculum
Percentage Career Education Completers-Hospitality and Tourism	0.09	Weak, positive	Small districts offer diverse curriculum

Extracurricular Programs Offered

- Questions: How does the size of a school impact the extracurricular programs offered to students?
- Analysis: Evaluated information from the Arkansas Activities Association for both athletic and non-athletic activities, based on 2018-19 school year
  - As expected, larger schools can offer more activities, both athletic and non-athletic
  - The amount of non-athletic activities is less than athletic activities and has a weaker relationship to school size


Athletic Activities Offered
Correlation Coefficient 0.74
Athletic Activities Offered
High School Enrollment
0
5
10
15
20
25
30
35
40
0
500
1000
1500
2000
2500
3000
3500


Non-Athletic Activities Offered
Correlation Coefficient 0.35
Non-Athletic Activities Offered
High School Enrollment
0
2
4
6
8
10
12
14
16
18
20
0
500
1000
1500
2000
2500
3000
3500

Summary Table – Extracurricular Activities Offered vs. High School Enrollment

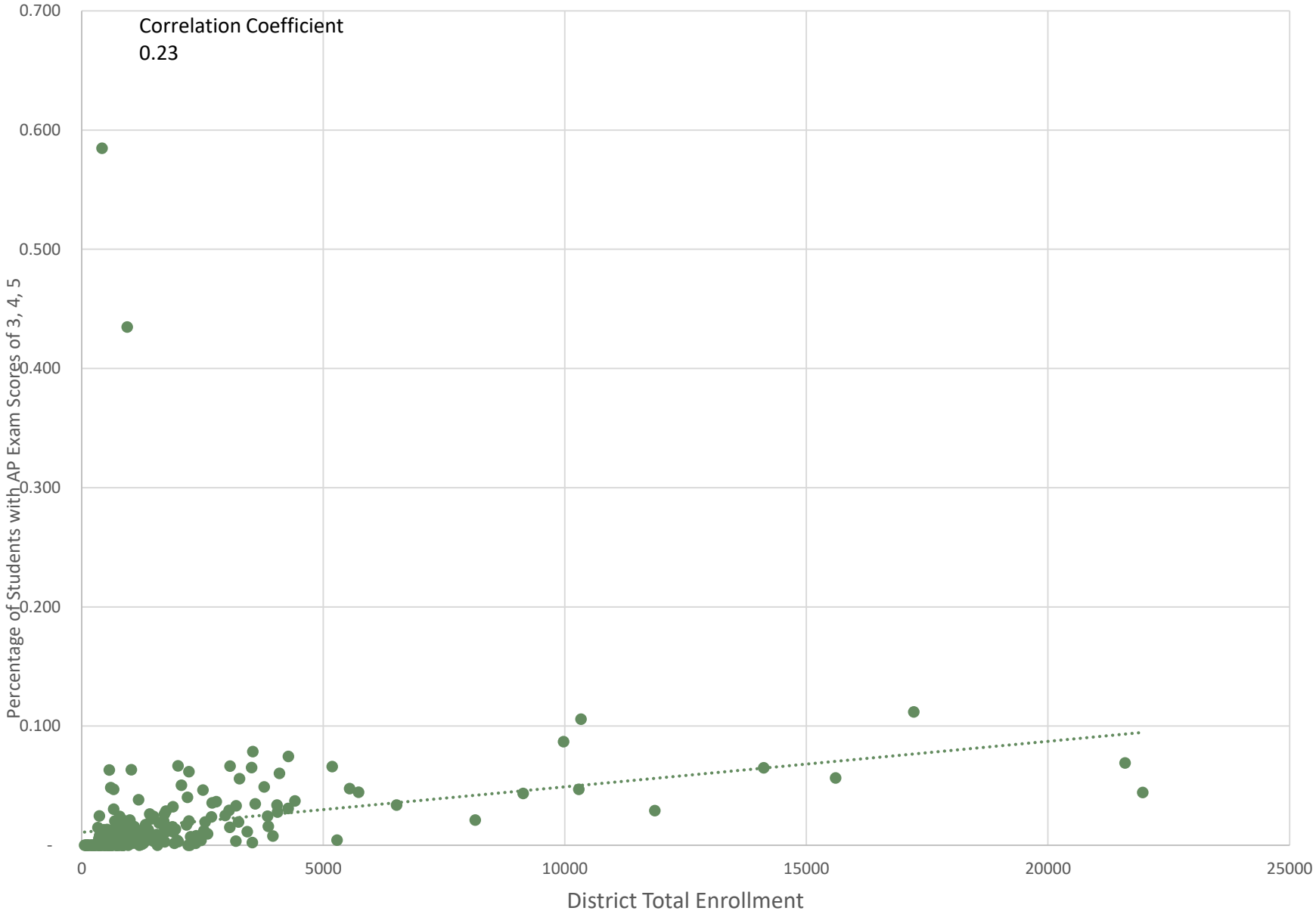
Variable	Correlation Coefficient	Strength of Relationship	Analysis, Possible Reasons
Athletics	0.74	Strong relationship, positive	More students to fill more teams
Non-Athletics	0.35	Weak relationship, positive	More students to participate in more activities

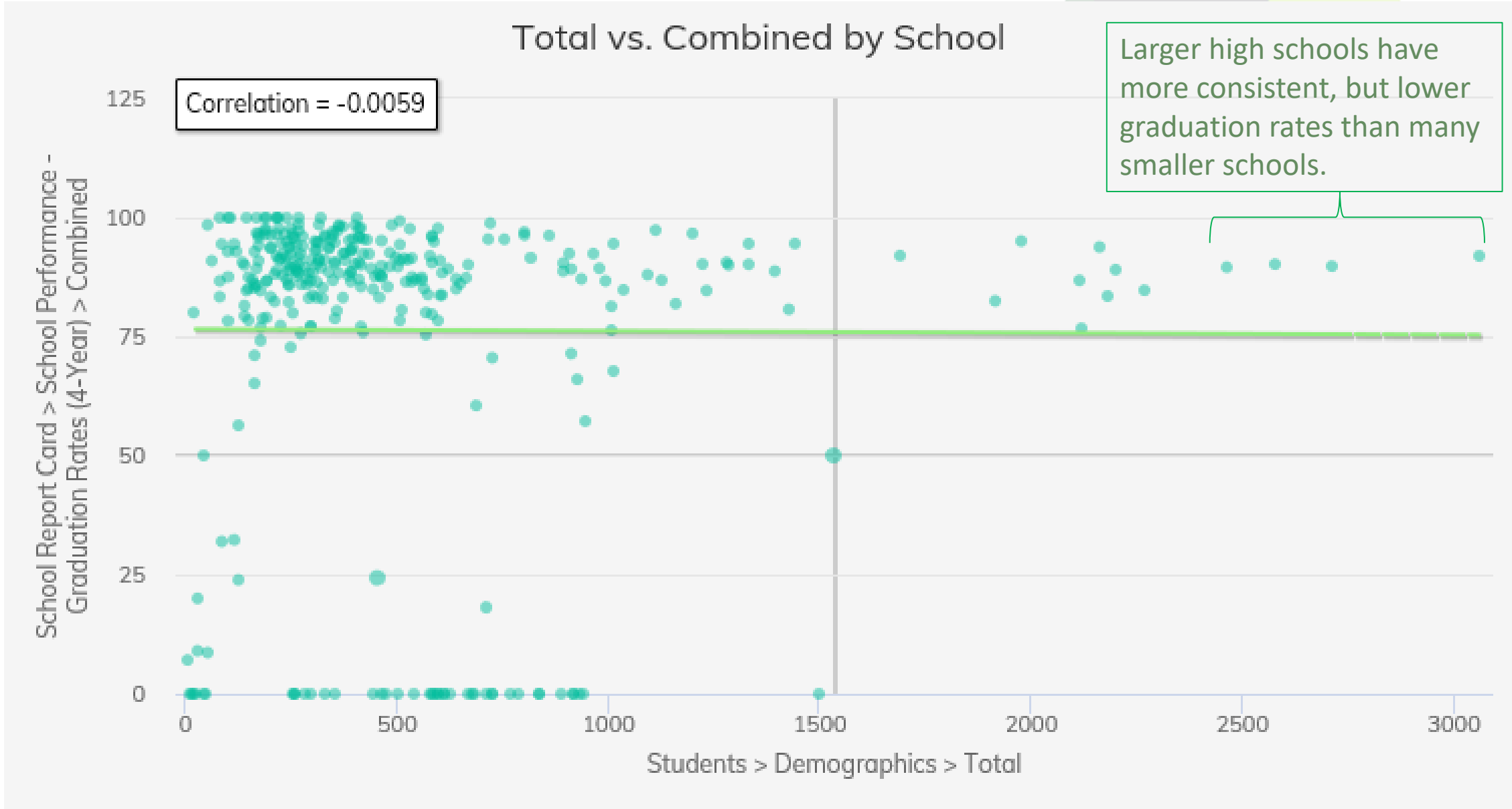
School Performance

- Question: Can larger schools outperform smaller schools?
- Analysis:
  - Larger districts show more consistent, but lower graduation rates than smaller districts that have more variation in graduation rates
  - Although there is a weak, positive relationship between district size and certain measures, such as AP test scores, many small districts show equally good results

- Note: Other components of this study will address student assessment outcomes

AP Exams Scored 3,4,5 per Pupil




Total vs. Combined by School
Correlation = -0.0059
Larger high schools have more consistent, but lower graduation rates than many smaller schools.
School Report Card > School Performance - Graduation Rates (4-Year) > Combined
125
100
75
50
25
0
0
500
1000
1500
2000
2500
3000
Students > Demographics > Total

Summary Table – School Performance vs. Enrollment

Variable	Correlation Coefficient	Strength of Relationship	Analysis, Possible Reasons
AP Exams scored 3, 4, 5 per Pupil	0.23	Weak, positive	Small schools offer strong instructional programs
Graduation Rates (4 year)	-0.006	None	

Conclusions and Possible Recommendations

- General
  - For most variables, this research indicates that small districts and schools can perform as well as larger districts and schools
  - Very specific reasons explain why some variables show positive or negative relationships to size
- Optimal size for school districts and schools is hard to define due to many weak relationships as well as different perspectives on the importance of the variables ranging from operational efficiency to school performance

Questions?

Appendix – Many More Variables Analyzed

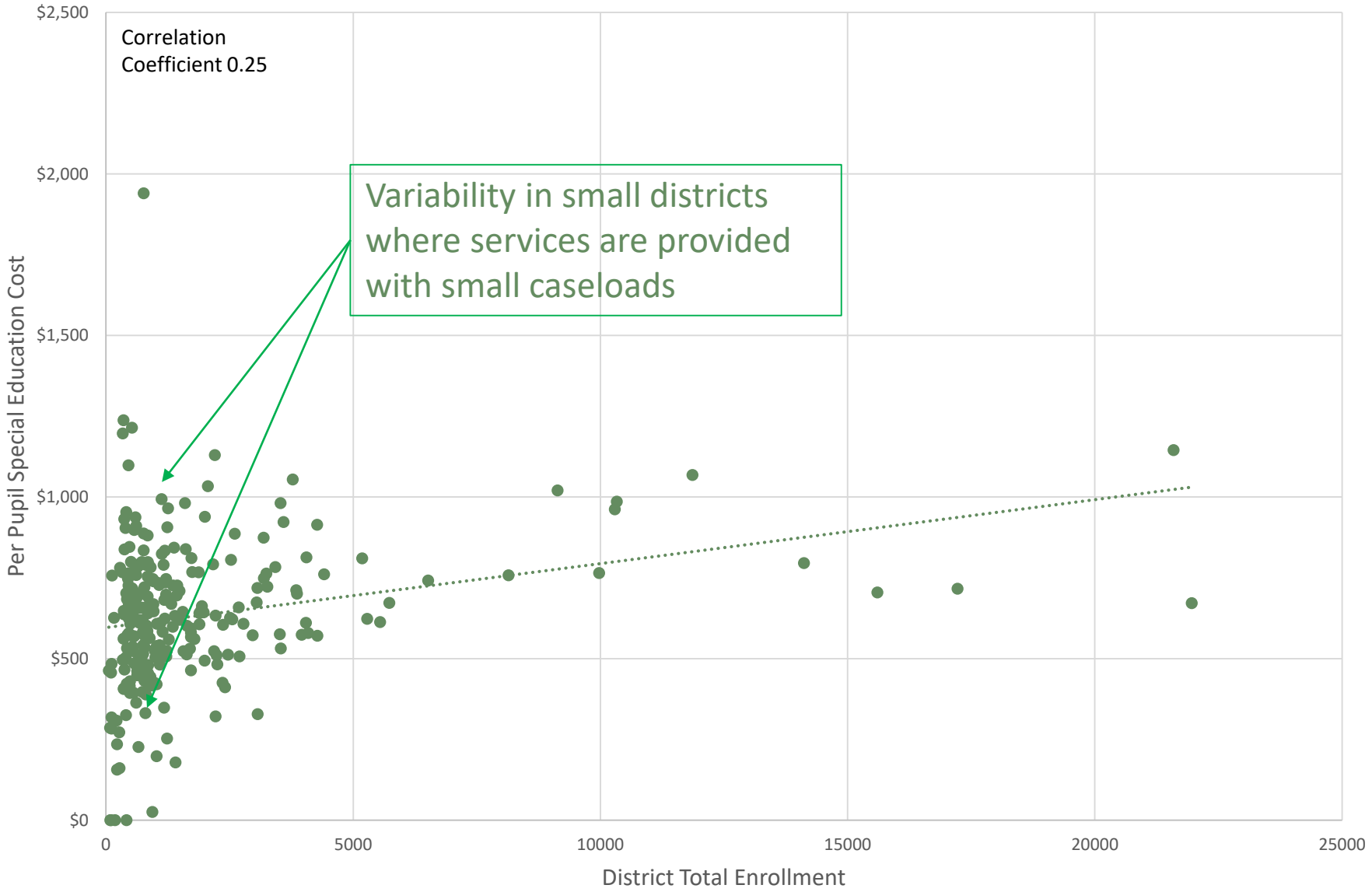
- These variables have been analyzed and are included in Summary Tables
- Variables in the Appendix are organized into two sections:
  - District Size
  - School Size

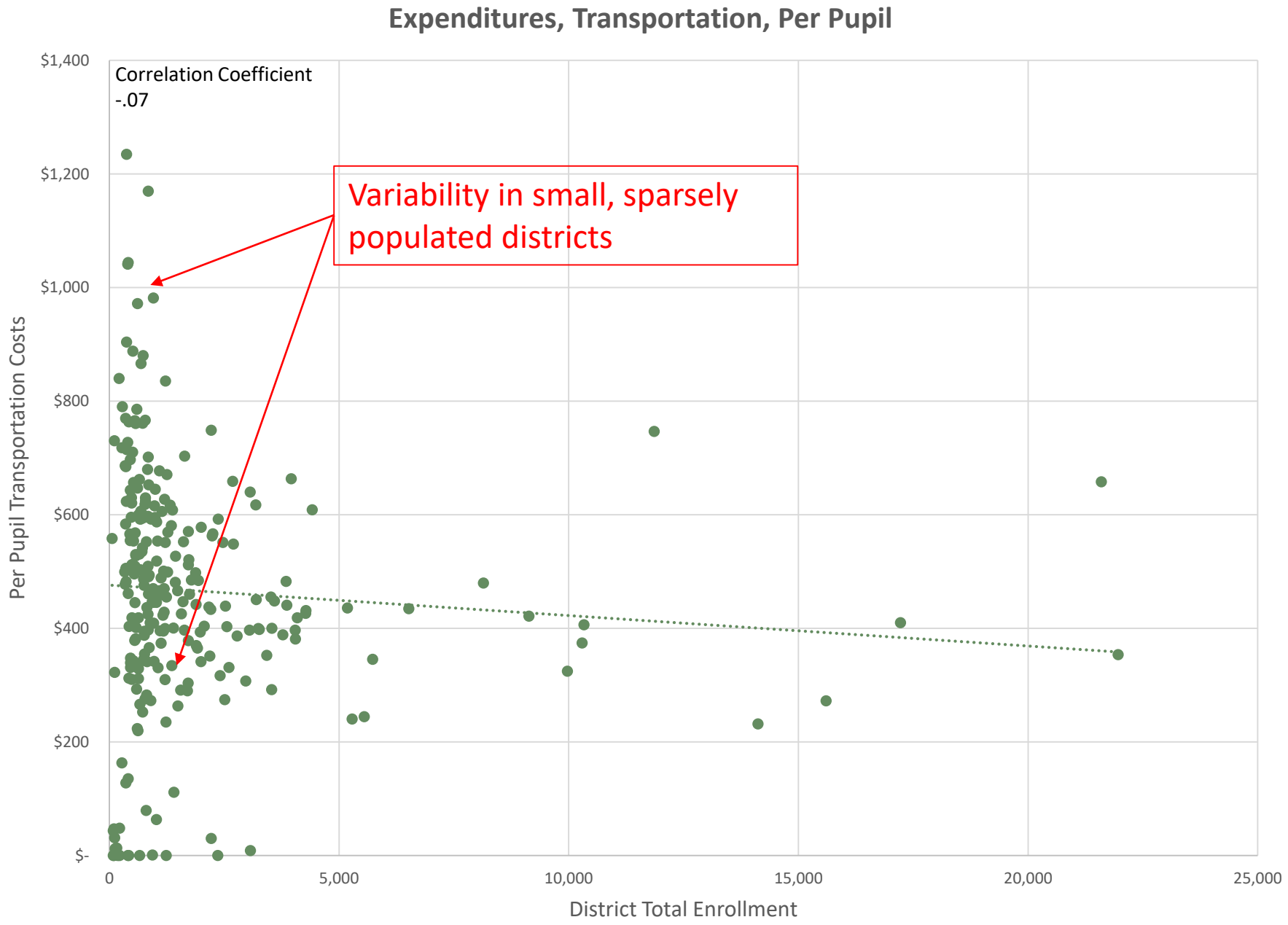
Appendix – District Size Analysis

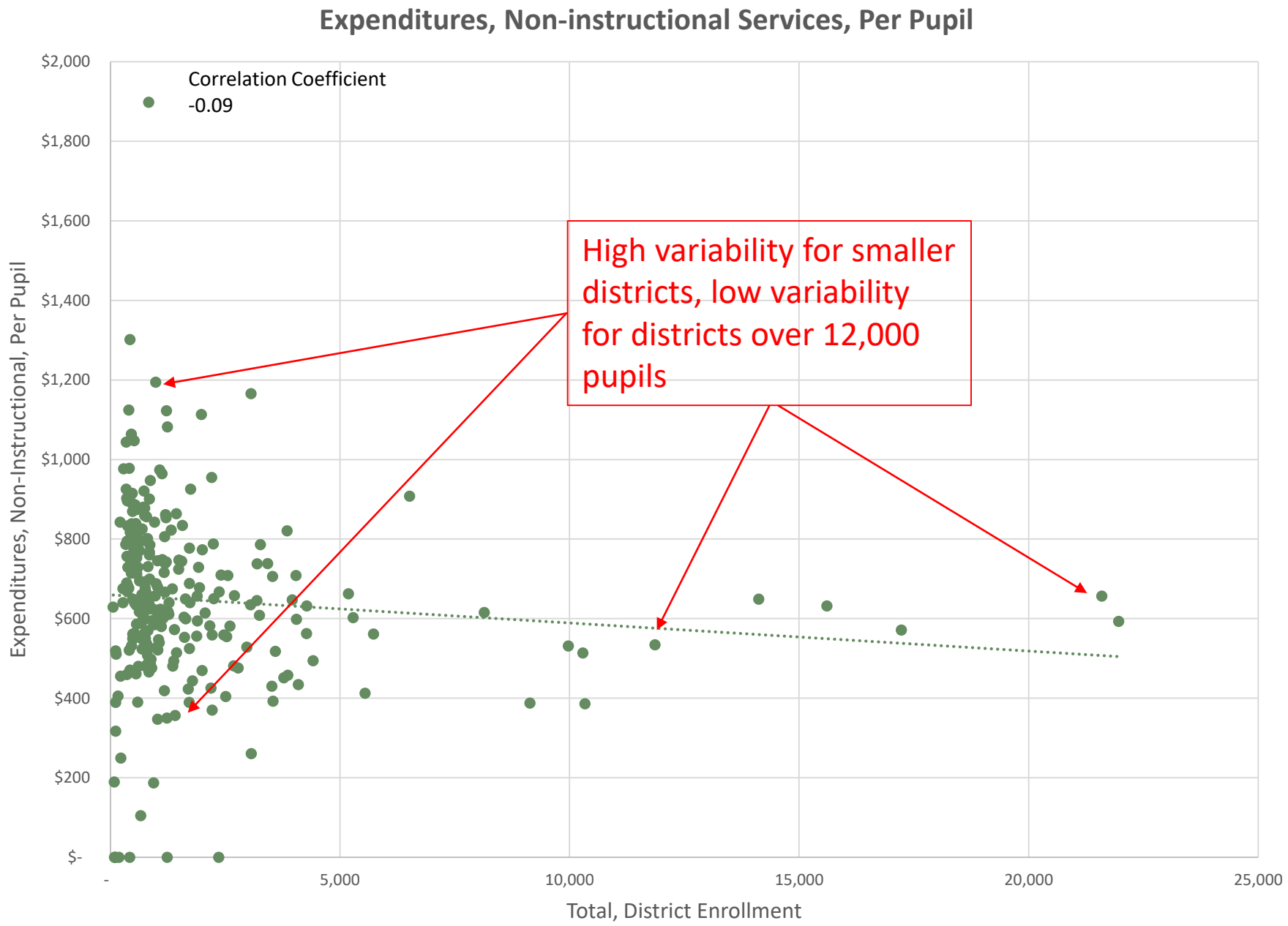
Variable Category	Slide Numbers
District	
Operational Efficiency	66-68
Personnel and Workforce	70-71
Student Discipline – Infractions	73-76
Student Discipline – Disciplinary Actions	78-81
Curricular Diversity – Courses Taken	83-85
Specialize Program Requirements and Program Evaluation	87-92

Operational Efficiency

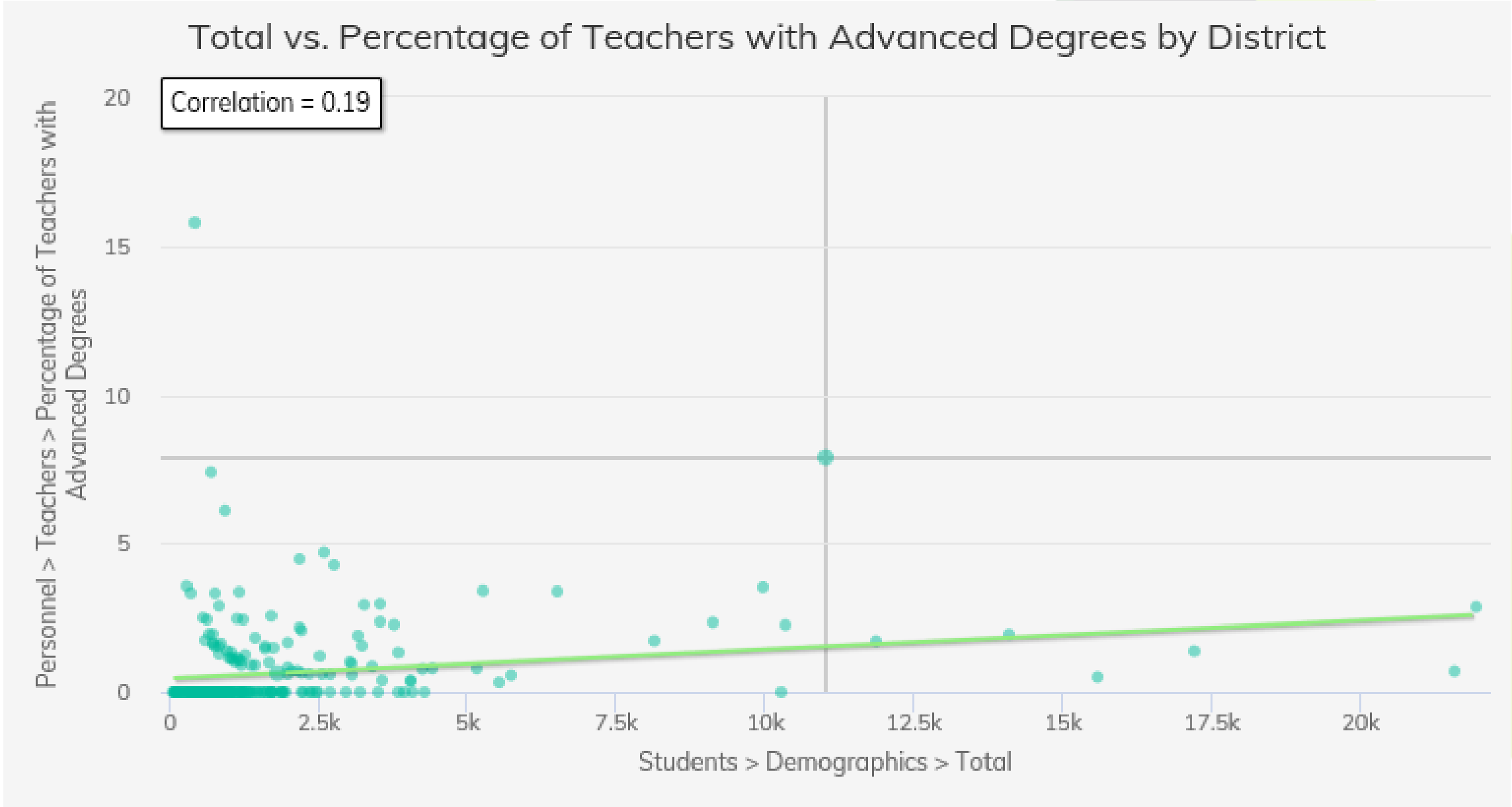
Expenditures, Special Education, Per Pupil
Total Special Education Cost Per Total Enrollment

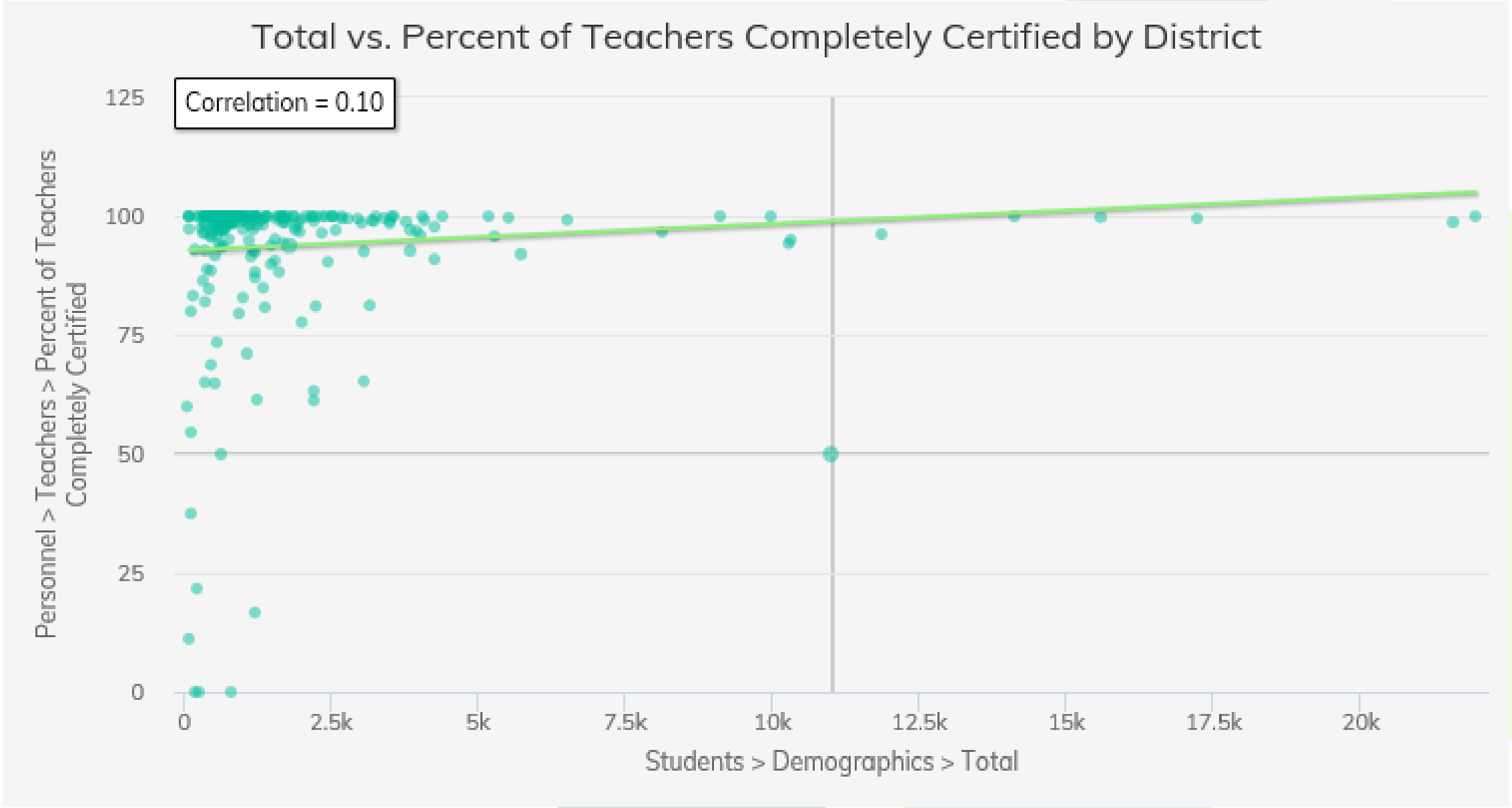



Expenditures, Transportation, Per Pupil
Correlation Coefficient
-.07
Variability in small, sparsely populated districts
Per Pupil Transportation Costs
$1,400
$1,200
$1,000
$800
$600
$400
$200
$-
0
5,000
10,000
15,000
20,000
25,000
District Total Enrollment

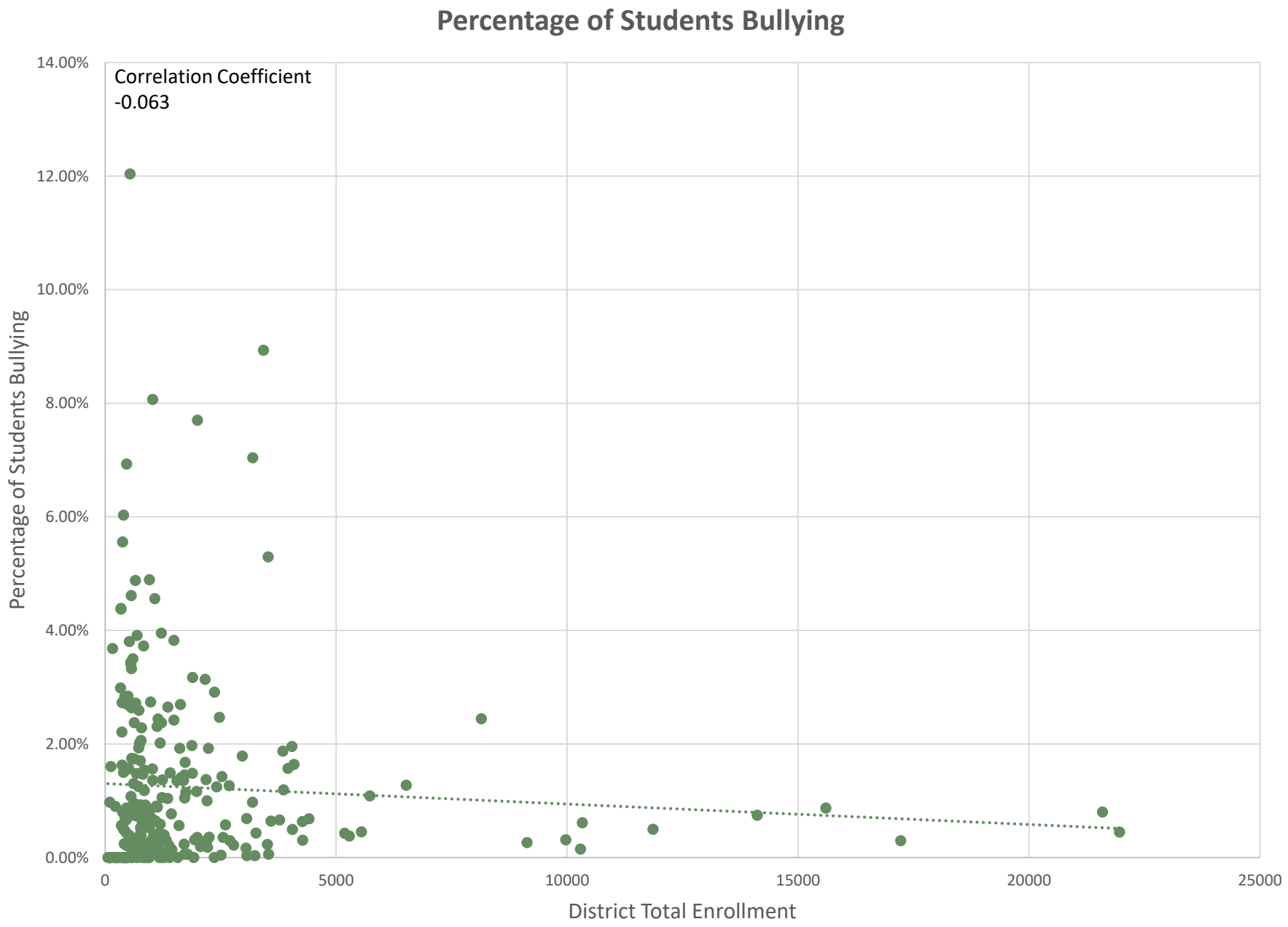

Expenditures, Non-instructional Services, Per Pupil
Correlation Coefficient
-0.09
High variability for smaller districts, low variability for districts over 12,000 pupils
Expenditures, Non-Instructional, Per Pupil
$2,000
$1,800
$1,600
$1,400
$1,200
$1,000
$800
$600
$400
$200
$-
-
5,000
10,000
15,000
20,000
25,000
Total, District Enrollment

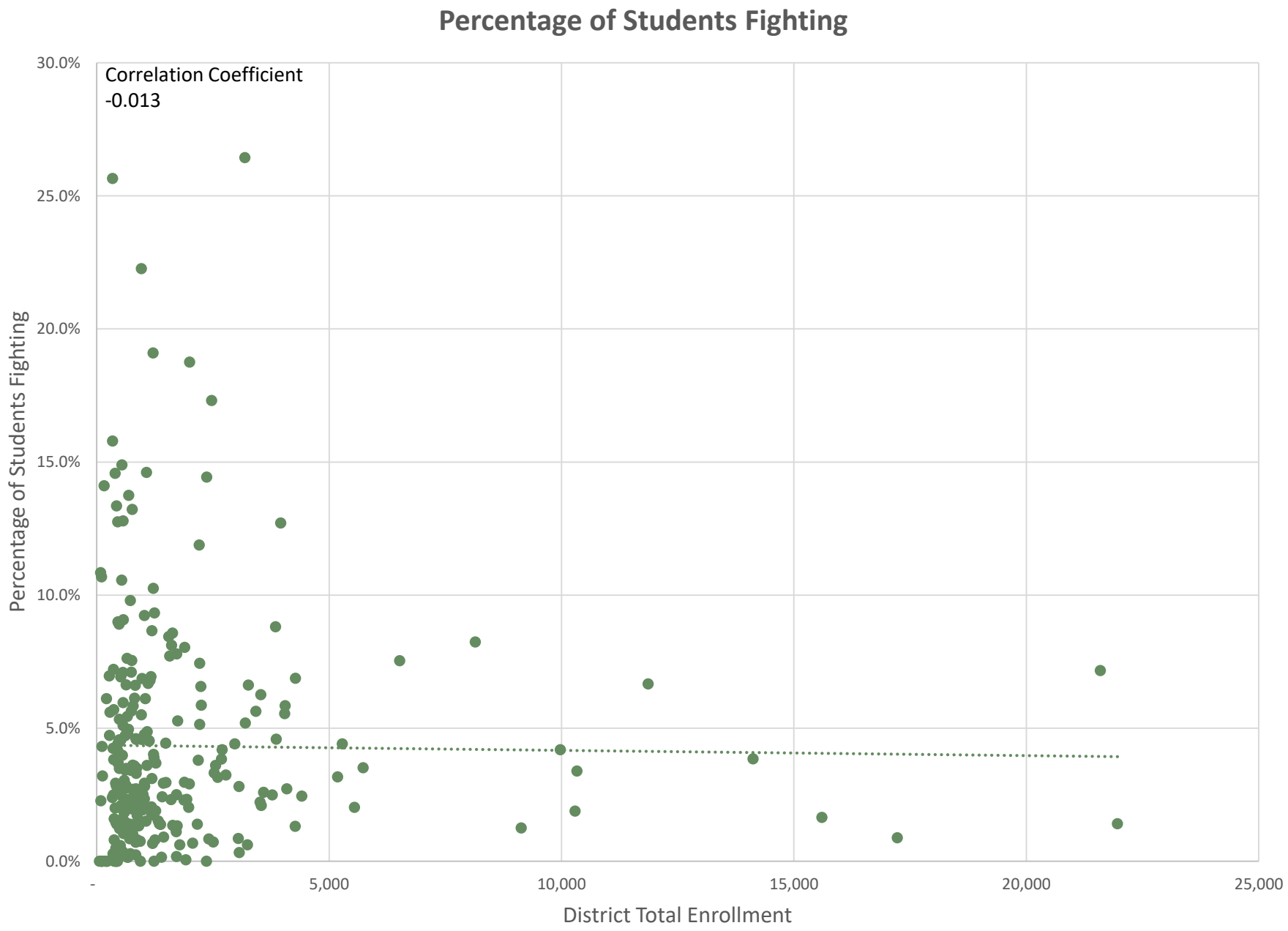
Personnel and Workforce

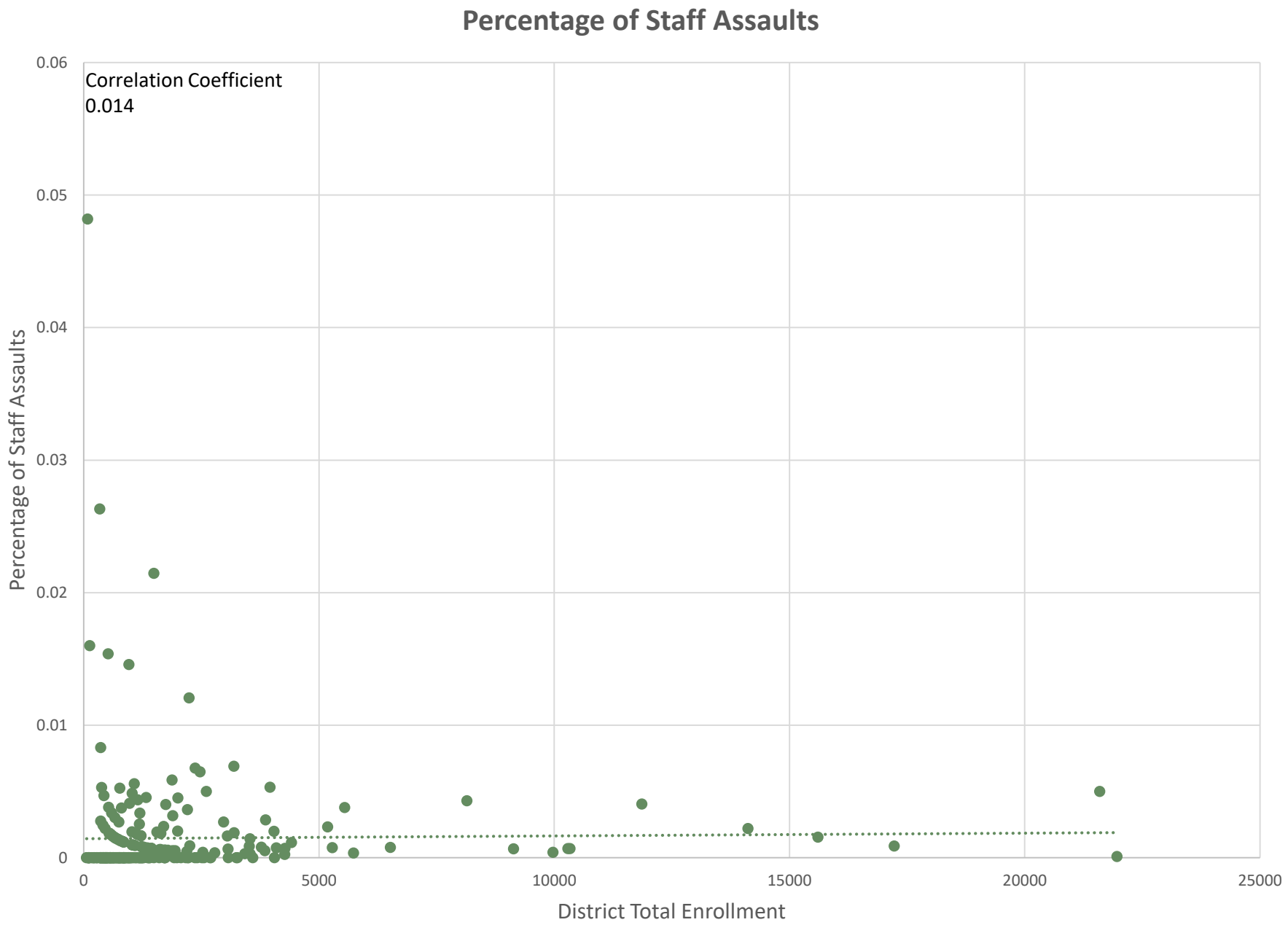

Total vs. Percentage of Teachers with Advanced Degrees by District
Correlation = 0.19
Personnel > Teachers > Percentage of Teachers with Advanced Degrees
20
15
10
5
0
0
2.5k
5k
7.5k
10k
12.5k
15k
17.5k
20k
Students > Demographics > Total

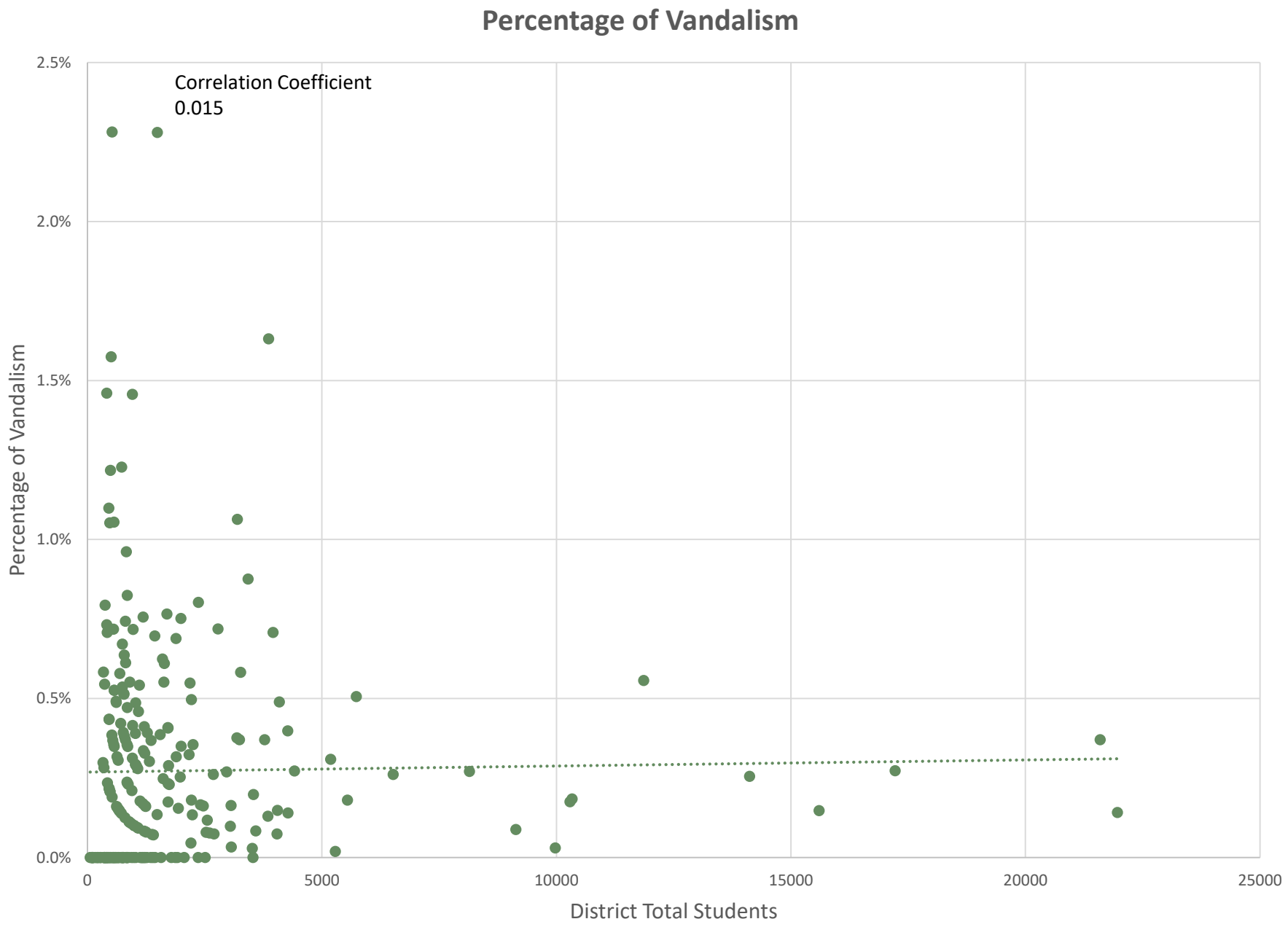

Total vs. Percent of Teachers Completely Certified by District
Correlation = 0.10
Personnel > Teachers > Percent of Teachers Completely Certified
125
100
75
50
25
0
0
2.5k
5k
7.5k
10k
12.5k
15k
17.5k
20k
Students > Demographics > Total

Student Discipline - Infractions

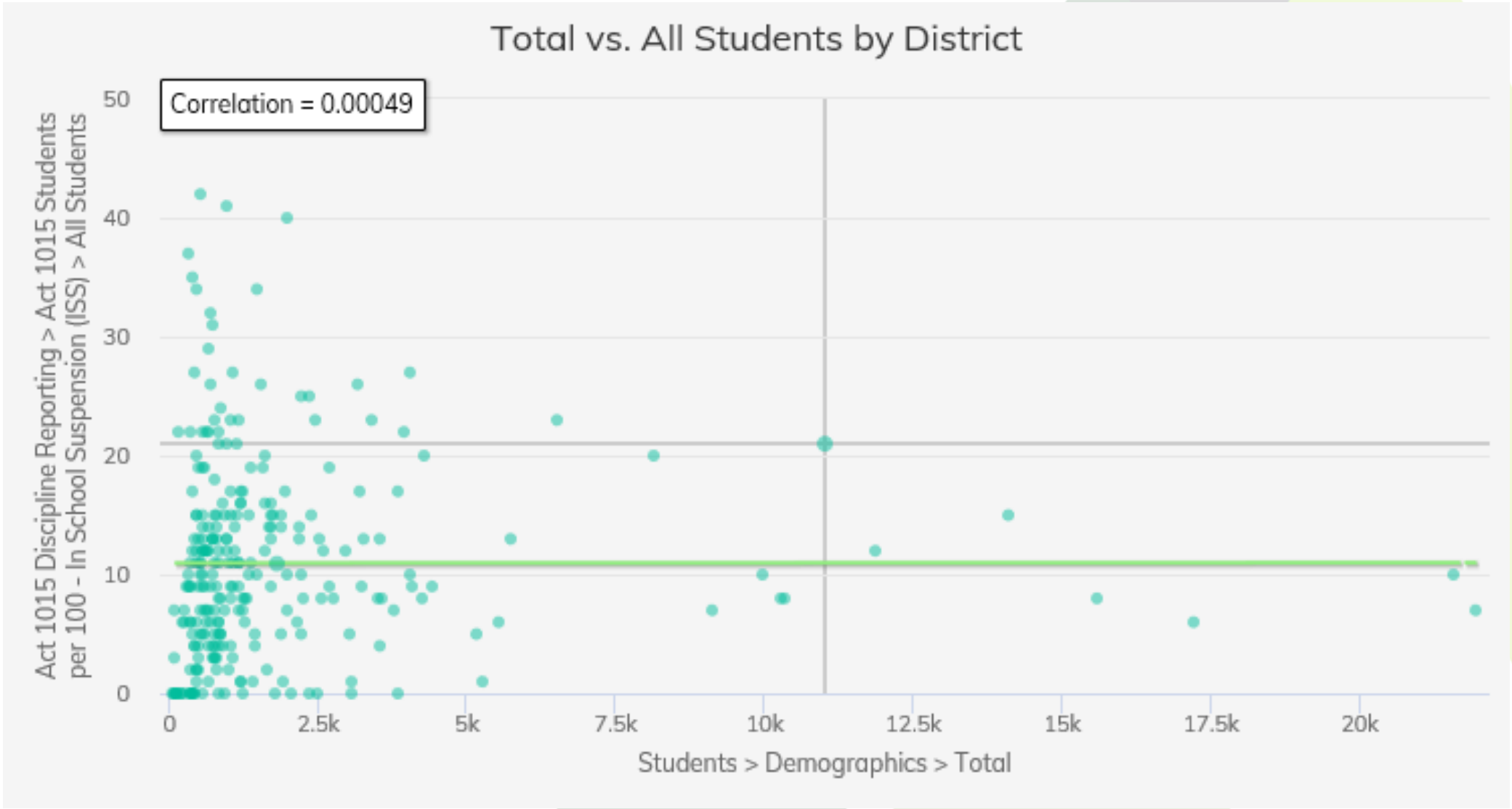

Percentage of Students Bullying
Correlation Coefficient
-0.063
14.00%
12.00%
10.00%
8.00%
6.00%
4.00%
2.00%
0.00%
Percentage of Students Bullying
0
5000
10000
15000
20000
25000
District Total Enrollment

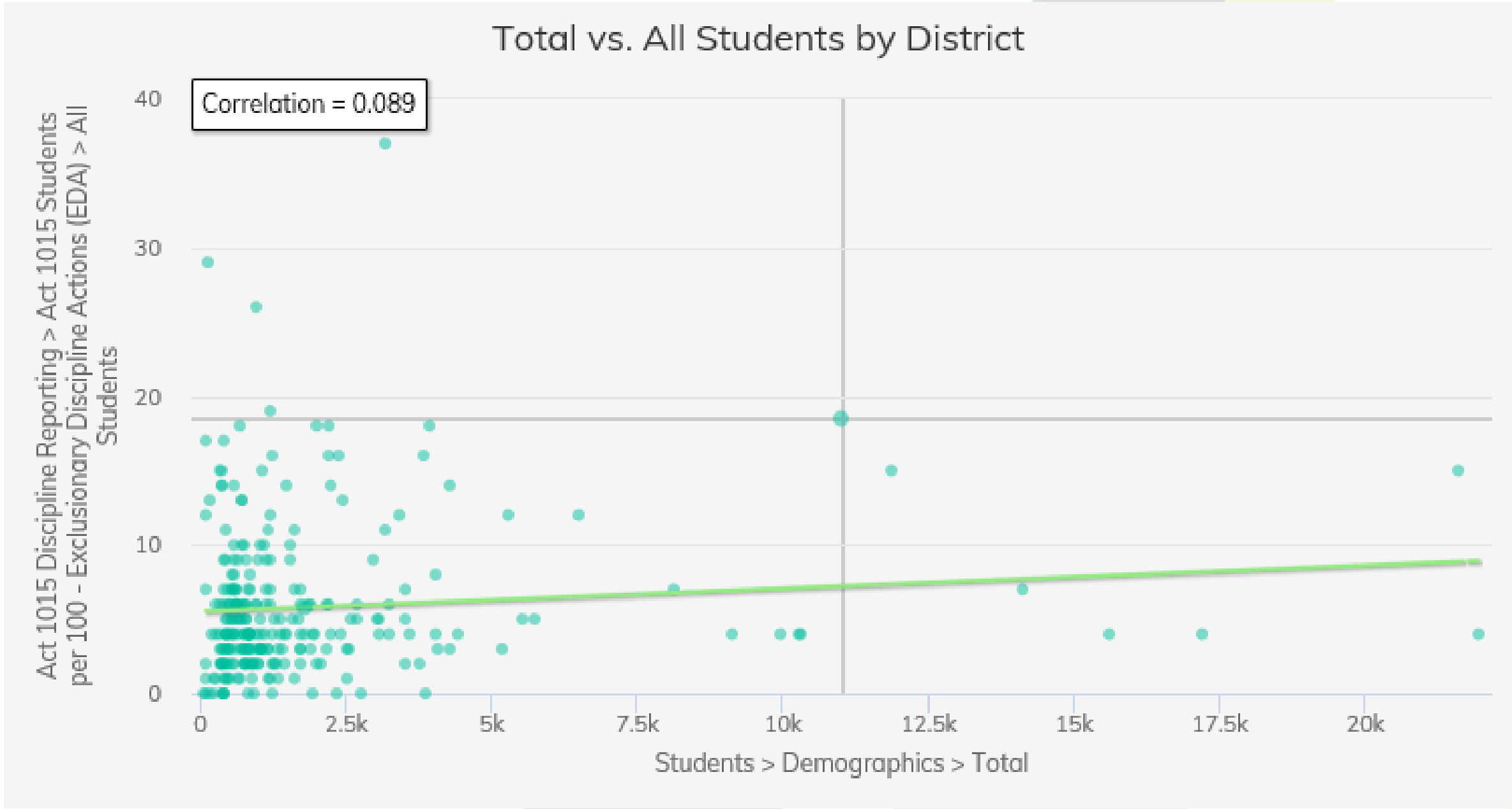

Percentage of Students Fighting
Correlation Coefficient
-0.013
30.0%
25.0%
20.0%
15.0%
10.0%
5.0%
0.0%
Percentage of Students Fighting
-
5,000
10,000
15,000
20,000
25,000
District Total Enrollment

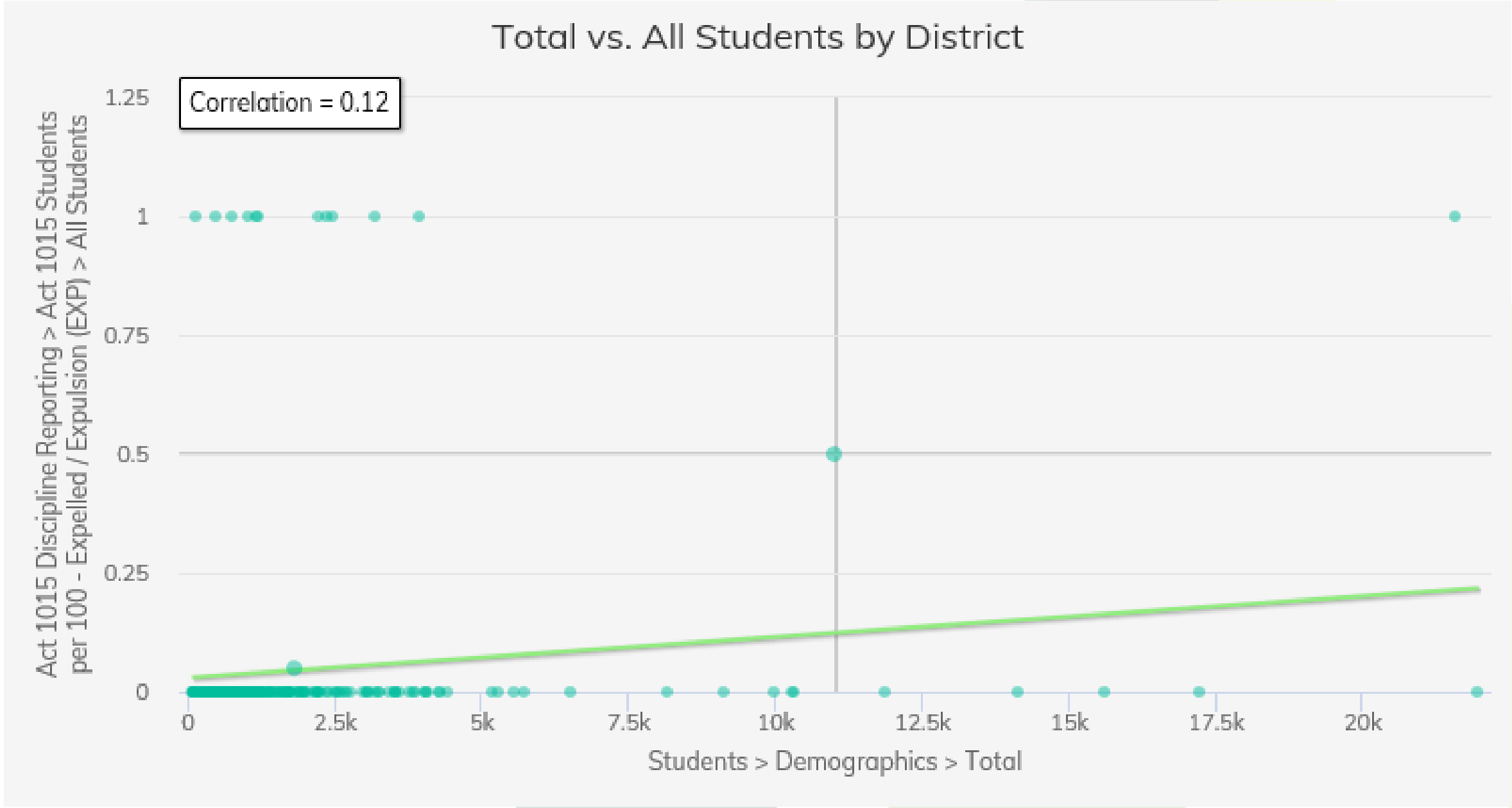

Percentage of Staff Assaults
Correlation Coefficient
0.014
0.06
0.05
0.04
0.03
0.02
0.01
0
Percentage of Staff Assaults
0
5000
10000
15000
20000
25000
District Total Enrollment

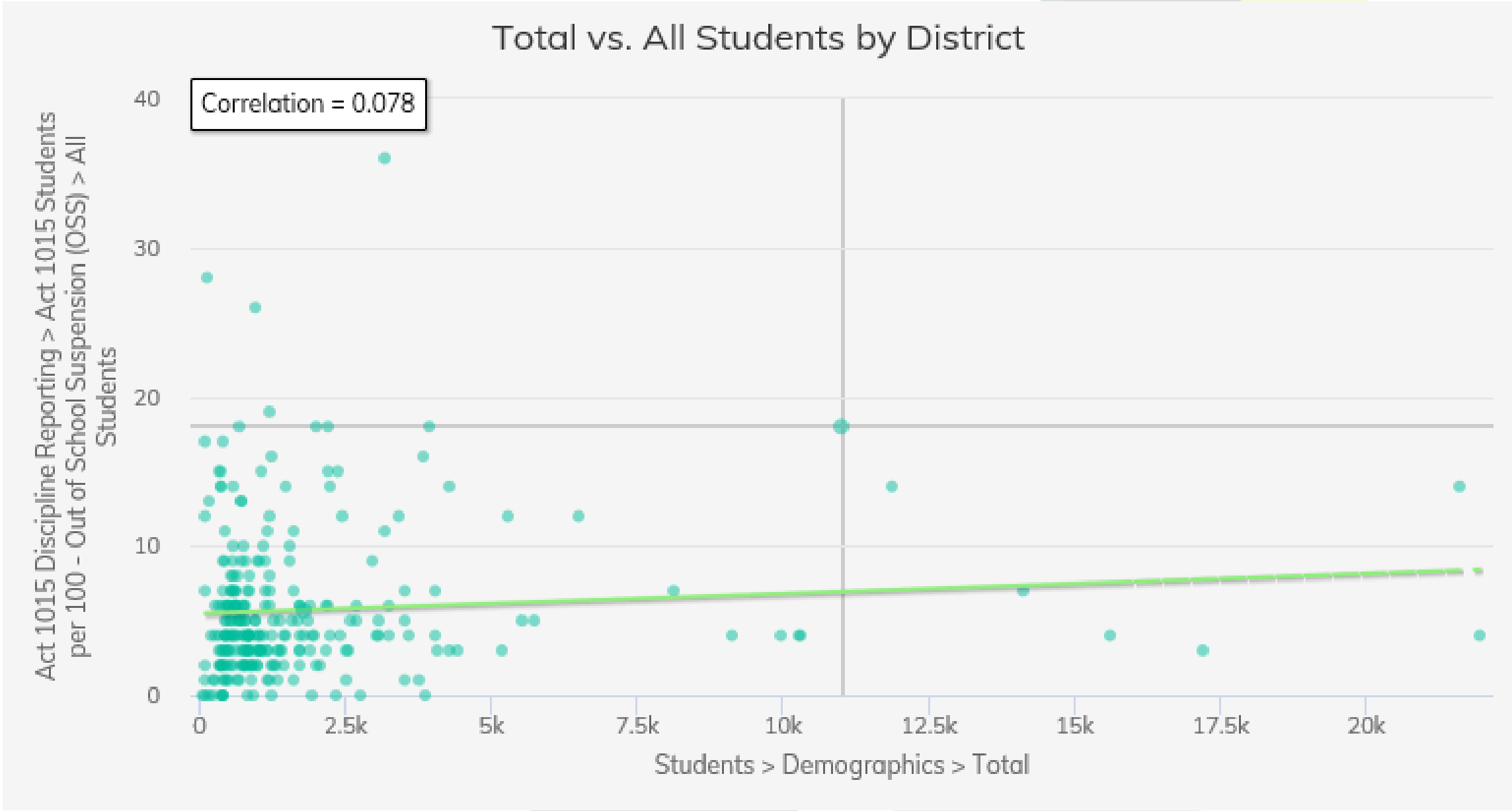

Percentage of Vandalism
Correlation Coefficient
0.015
2.5%
2.0%
1.5%
1.0%
0.5%
0.0%
Percentage of Vandalism
0
5000
10000
15000
20000
25000
District Total Students

Disciplinary Action

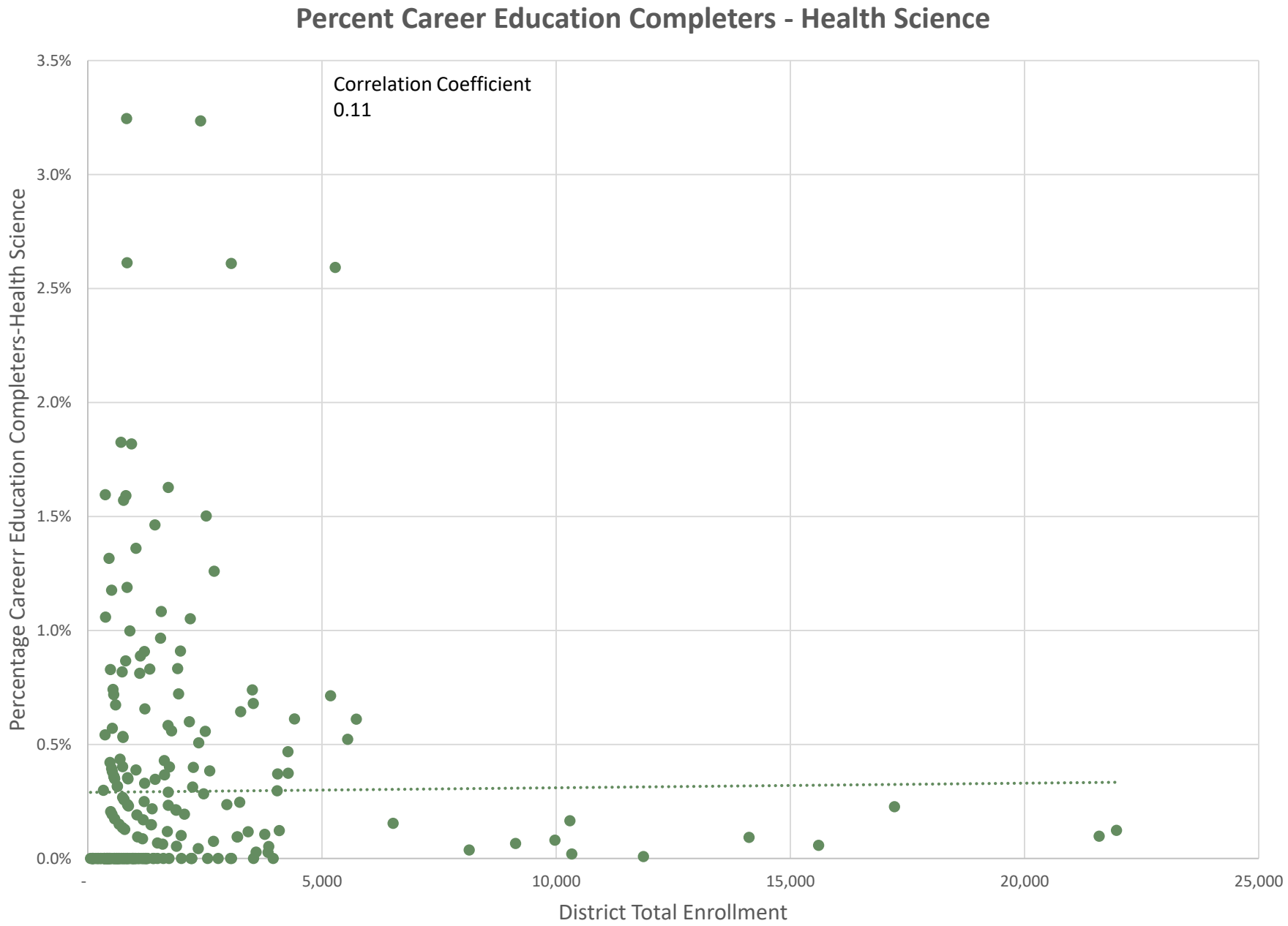

Total vs. All Students by District
Correlation = 0.00049
Act 1015 Discipline Reporting > Act 1015 Students per 100 - In School Suspension (ISS) > All Students
50
40
30
20
10
0
0
2.5k
5k
7.5k
10k
12.5k
15k
17.5k
20k
Students > Demographics > Total

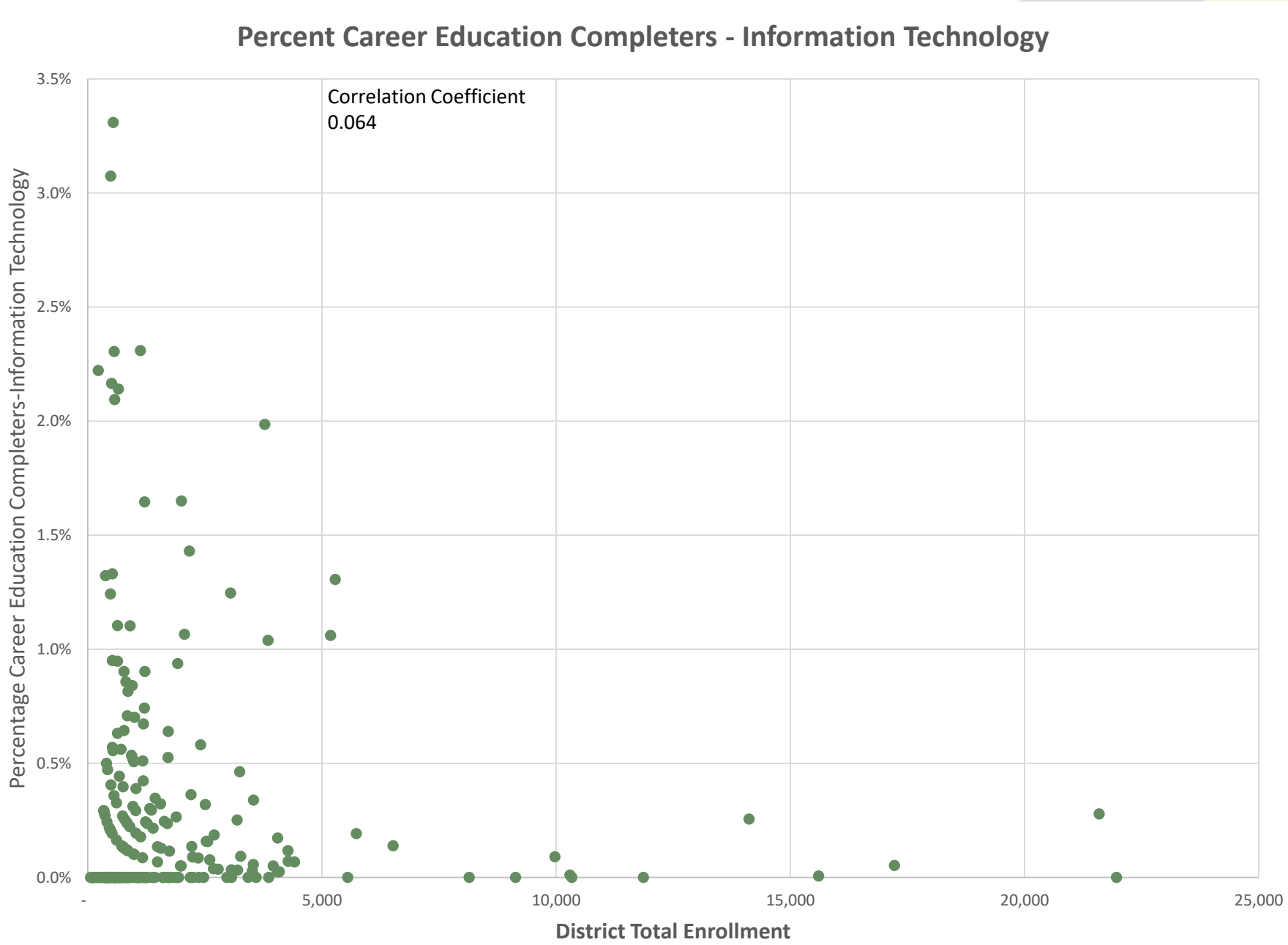

Total vs. All Students by District
Correlation = 0.089
Act 1015 Discipline Reporting > Act 1015 Students per 100 - Exclusionary Discipline Actions (EDA) > All Students
40
30
20
10
0
0
2.5k
5k
7.5k
10k
12.5k
15k
17.5k
20k
Students > Demographics > Total

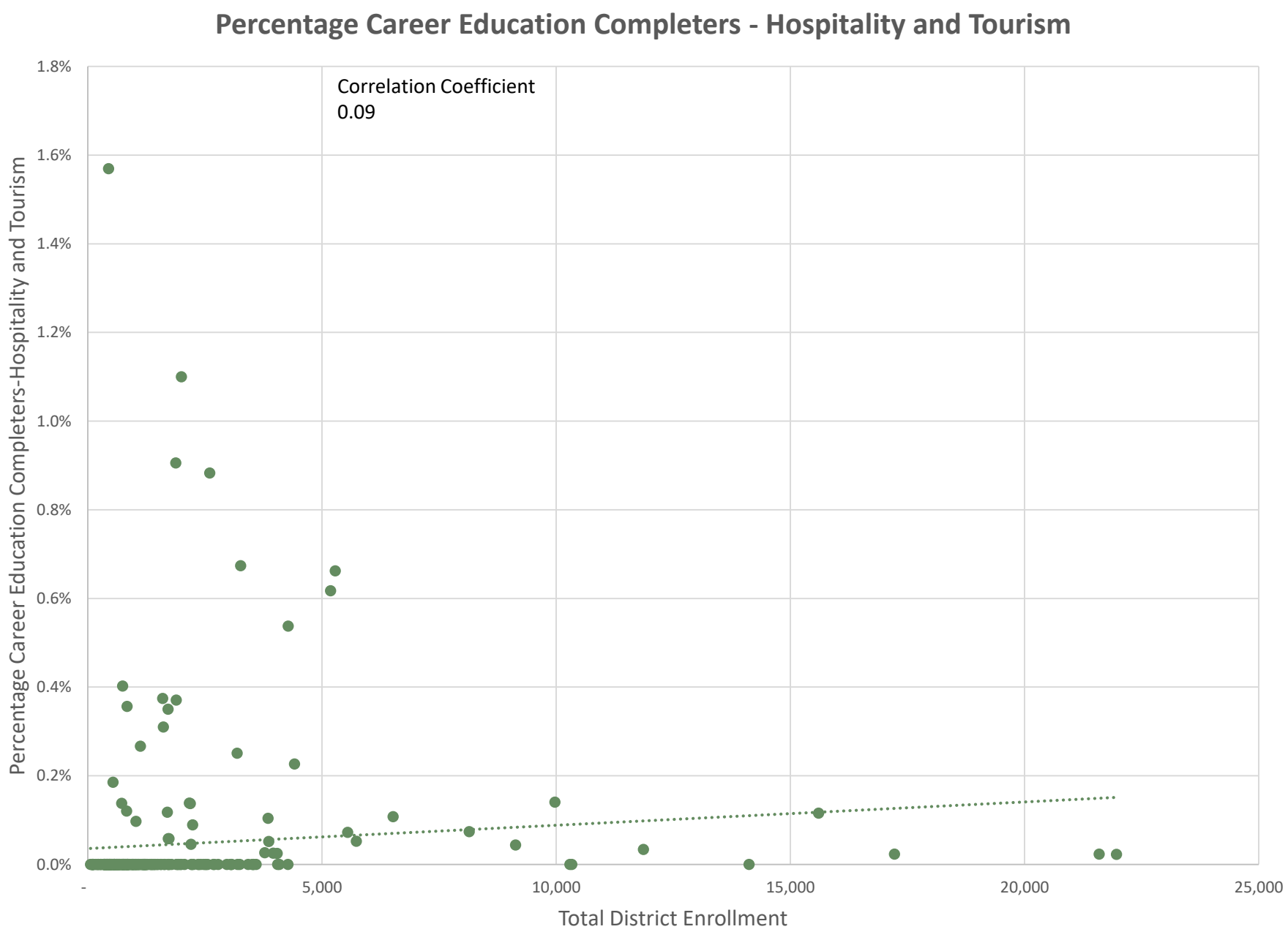

Total vs. All Students by District
Correlation = 0.12
Act 1015 Discipline Reporting > Act 1015 Students per 100 - Expelled / Expulsion (EXP) > All Students
1.25
1
0.75
0.5
0.25
0
0
2.5k
5k
7.5k
10k
12.5k
15k
17.5k
20k
Students > Demographics > Total


Total vs. All Students by District
Correlation = 0.078
Act 1015 Discipline Reporting > Act 1015 Students per 100 - Out of School Suspension (OSS) > All Students
40
30
20
10
0
0
2.5k
5k
7.5k
10k
12.5k
15k
17.5k
20k
Students > Demographics > Total

Curricular Diversity

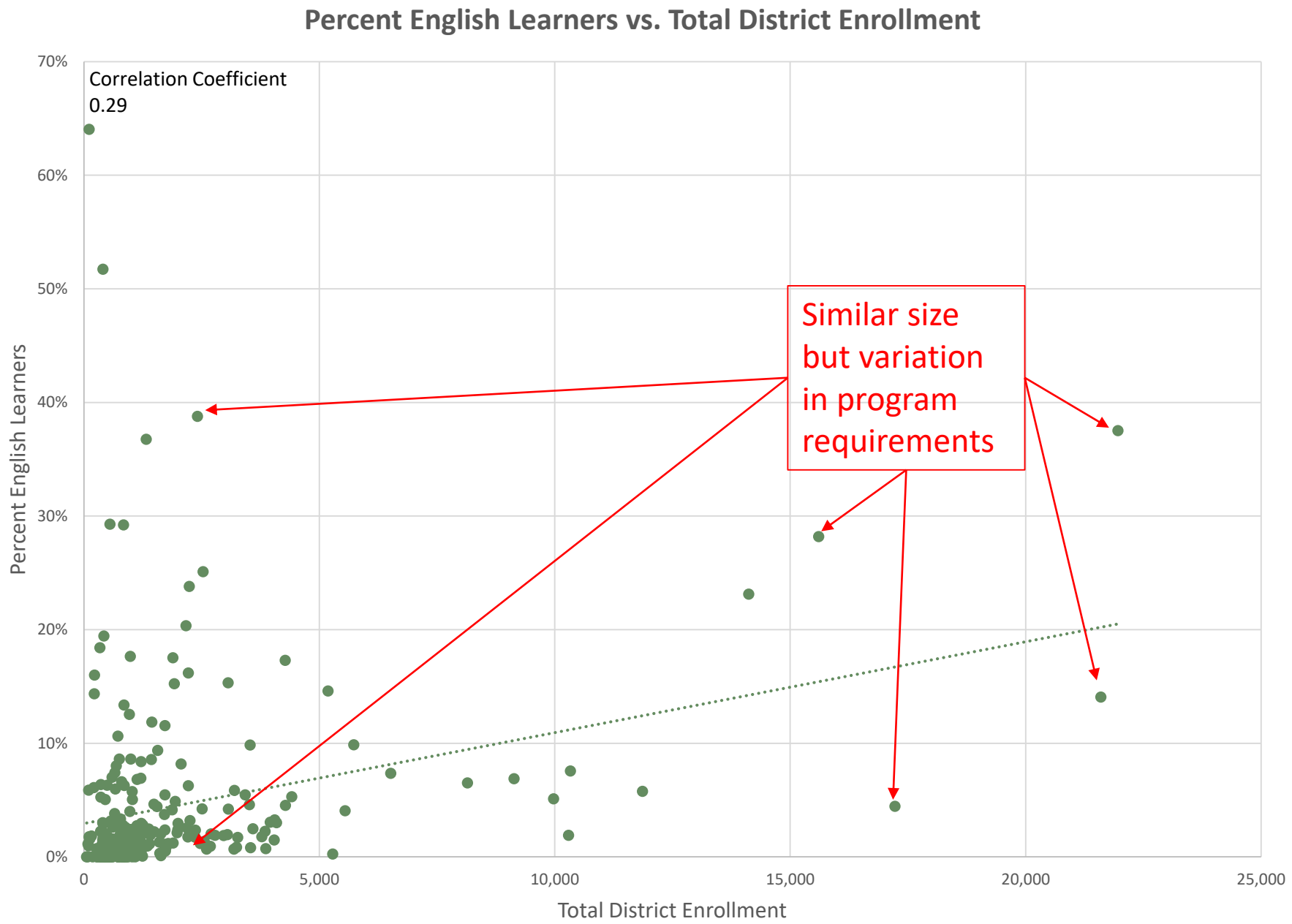

Percent Career Education Completers - Health Science
Correlation Coefficient
0.11
Percentage Careerr Education Completers-Health Science
3.5%
3.0%
2.5%
2.0%
1.5%
1.0%
0.5%
0.0%
-
5,000
10,000
15,000
20,000
25,000
District Total Enrollment

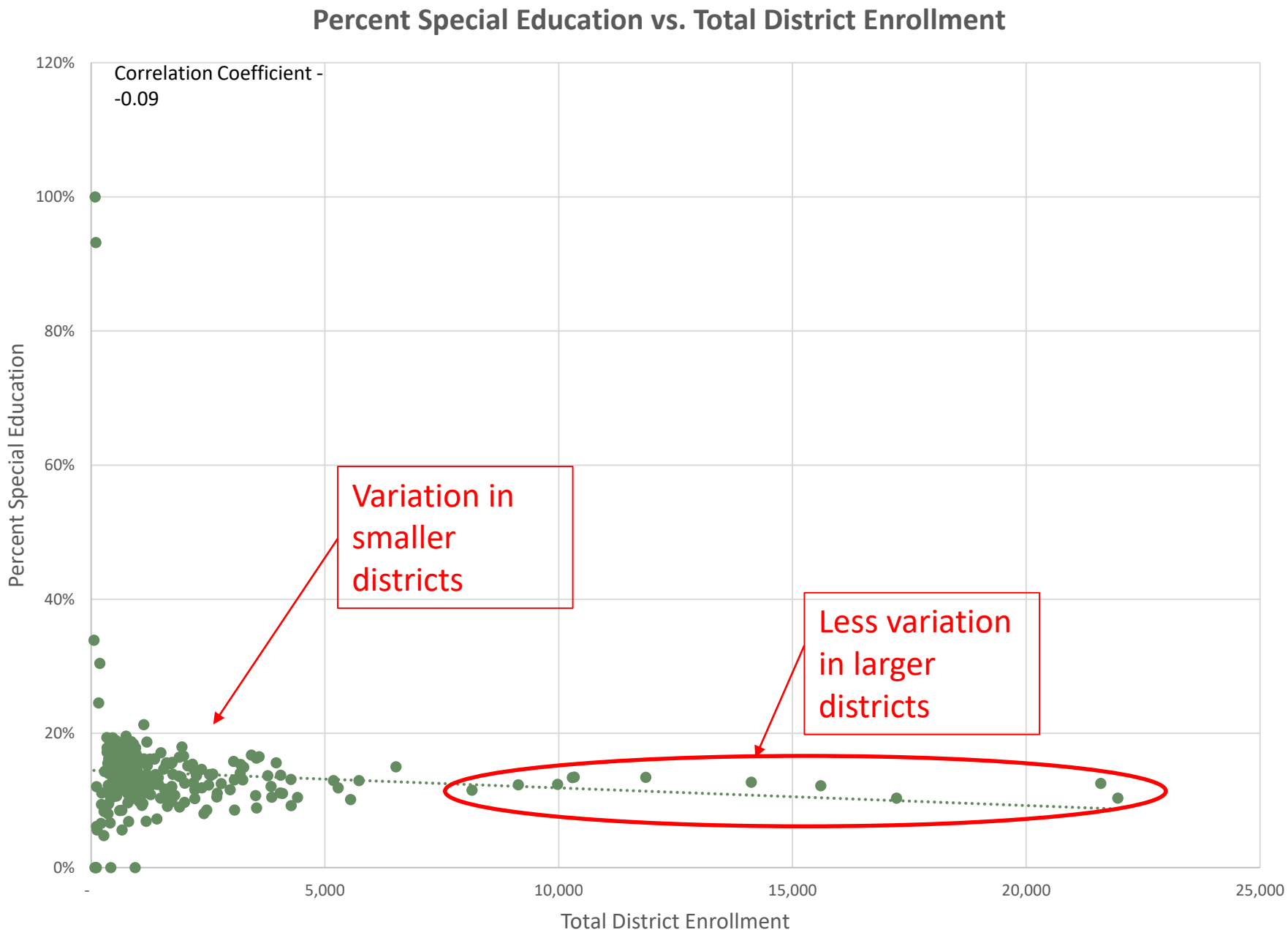

Percent Career Education Completers - Information Technology
Correlation Coefficient
0.064
Percentage Career Education Completers-Information Technology
3.5%
3.0%
2.5%
2.0%
1.5%
1.0%
0.5%
0.0%
-
5,000
10,000
15,000
20,000
25,000
District Total Enrollment


Percentage Career Education Completers - Hospitality and Tourism
Correlation Coefficient
0.09
Percentage Career Education Completers-Hospitality and Tourism
1.8%
1.6%
1.4%
1.2%
1.0%
0.8%
0.6%
0.4%
0.2%
0.0%
-
5,000
10,000
15,000
20,000
25,000
Total District Enrollment

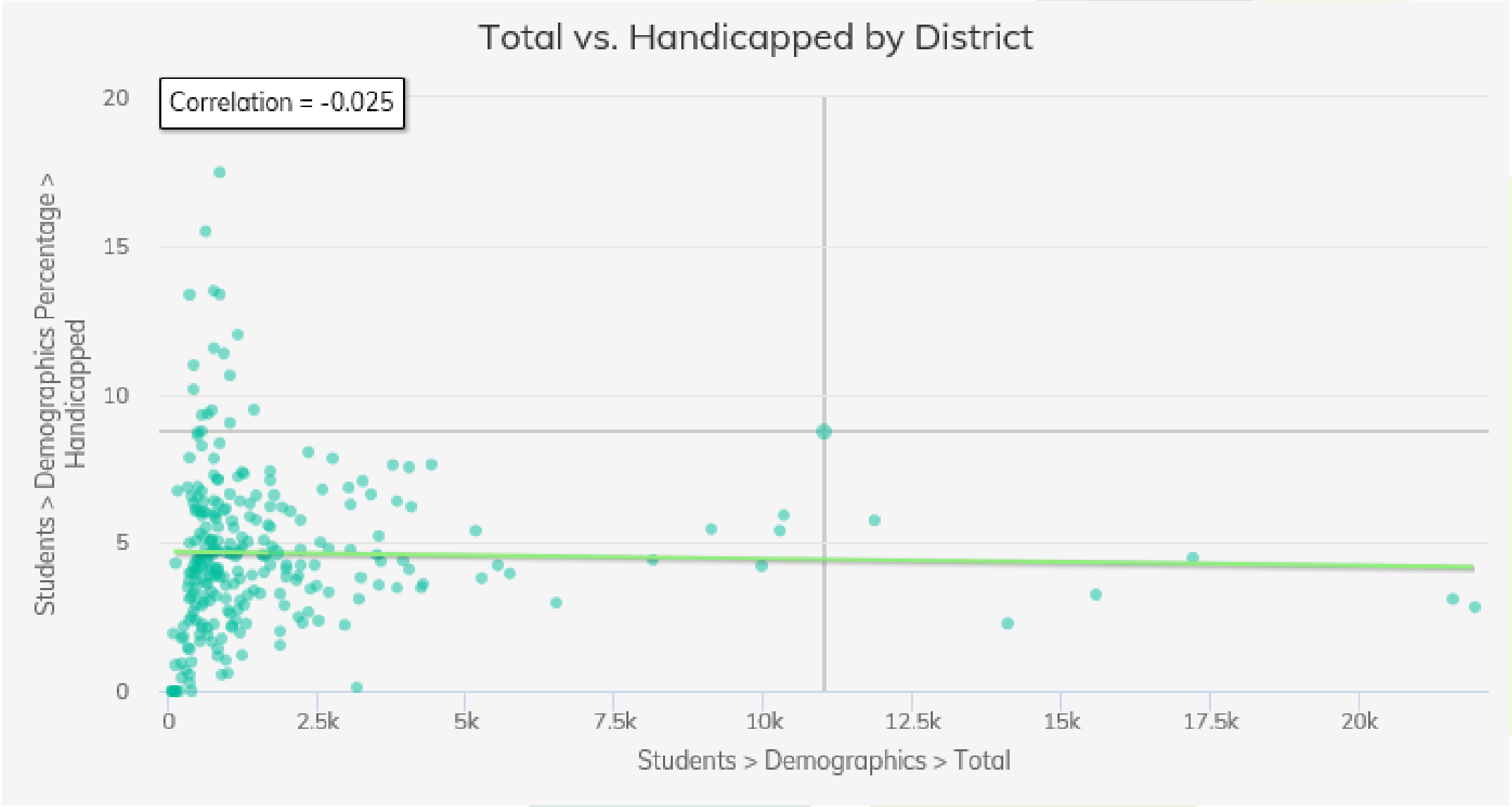
Specialized Program Requirements and Program Evaluation Variables

- Specialized program requirements differ by district size based on the characteristics of the community in each school district
  - English learners
  - Special education students
  - Handicapped students
  - Homeless students
  - Migrant students
  - Gifted and talented students

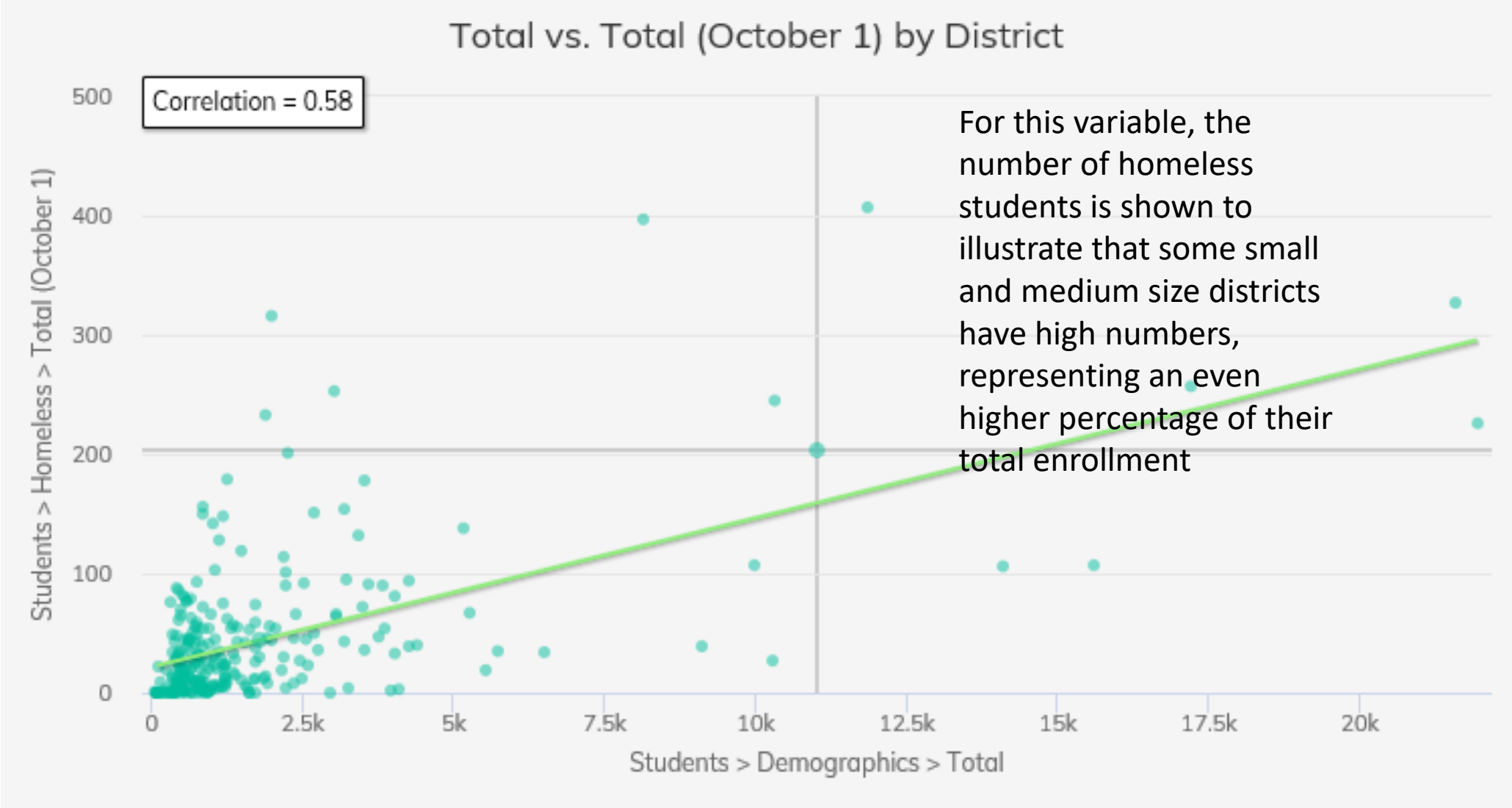

Percent English Learners vs. Total District Enrollment
Correlation Coefficient
0.29
Similar size
but variation
in program
requirements
70%
60%
50%
40%
30%
20%
10%
0%
Percent English Learners
0
5,000
10,000
15,000
20,000
25,000
Total District Enrollment


Percent Special Education vs. Total District Enrollment
Correlation Coefficient - -0.09
120%
100%
80%
60%
40%
20%
0%
Percent Special Education
Variation in smaller districts
Less variation in larger districts
-
5,000
10,000
15,000
20,000
25,000
Total District Enrollment

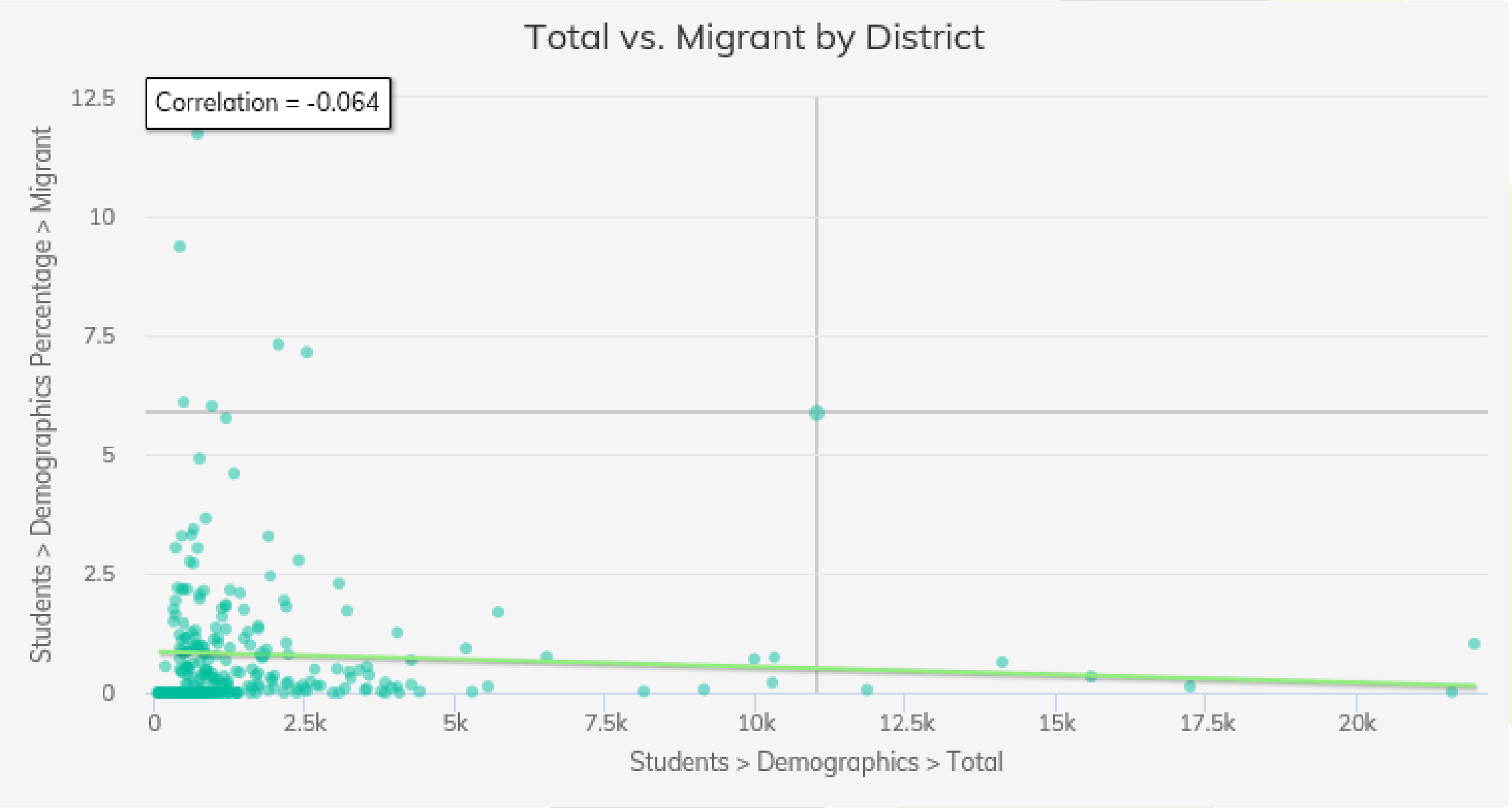
Definition of Handicapped

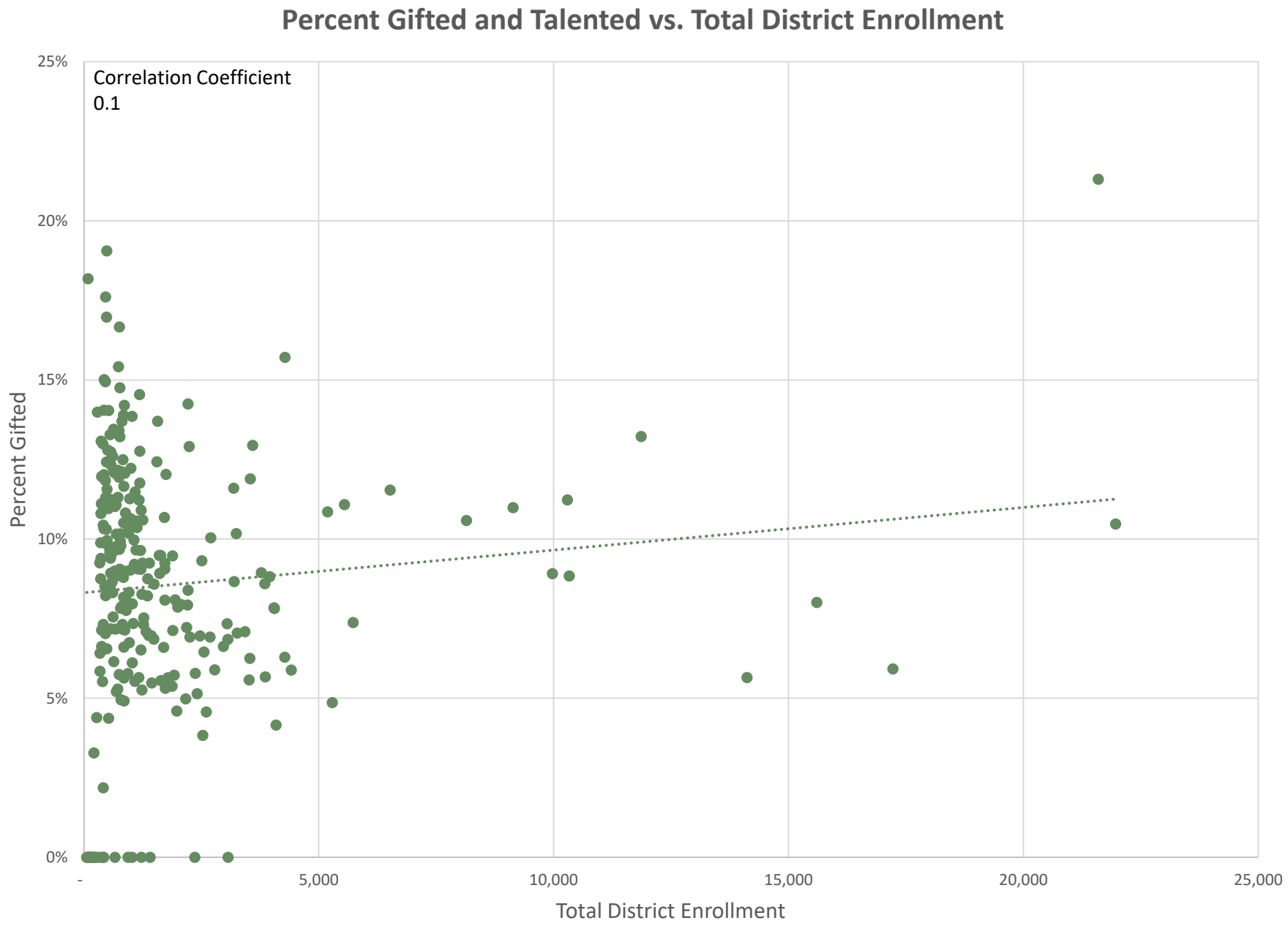


Homeless Students



For this variable, the number of homeless students is shown to illustrate that some small and medium size districts have high numbers, representing an even higher percentage of their total enrollment

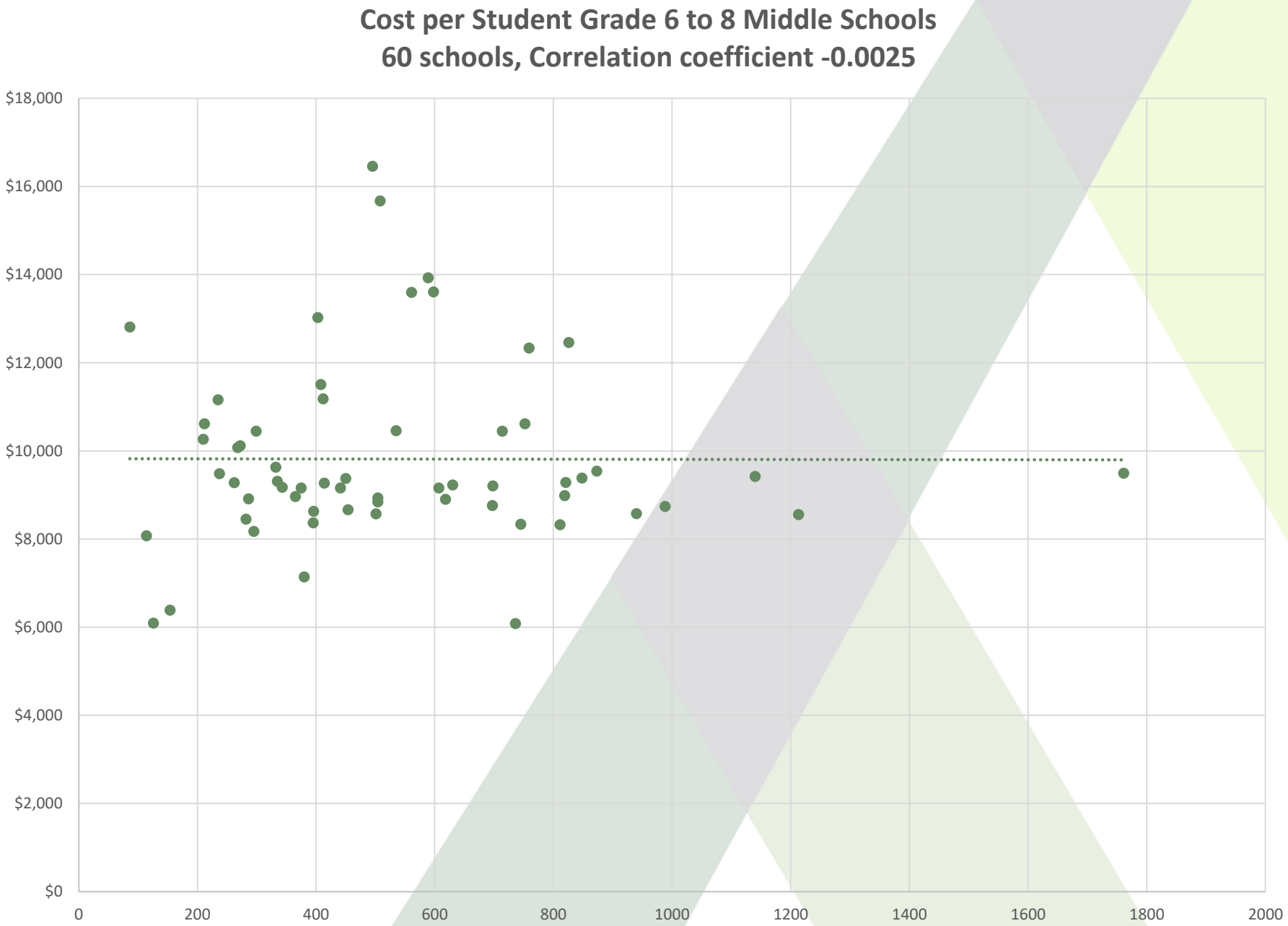

Total vs. Migrant by District
Correlation = -0.064
Students > Demographics Percentage > Migrant
12.5
10
7.5
5
2.5
0
0
2.5k
5k
7.5k
10k
12.5k
15k
17.5k
20k
Students > Demographics > Total


Percent Gifted and Talented vs. Total District Enrollment
Correlation Coefficient
0.1
25%
20%
15%
10%
5%
0%
Percent Gifted
-
5,000
10,000
15,000
20,000
25,000
Total District Enrollment

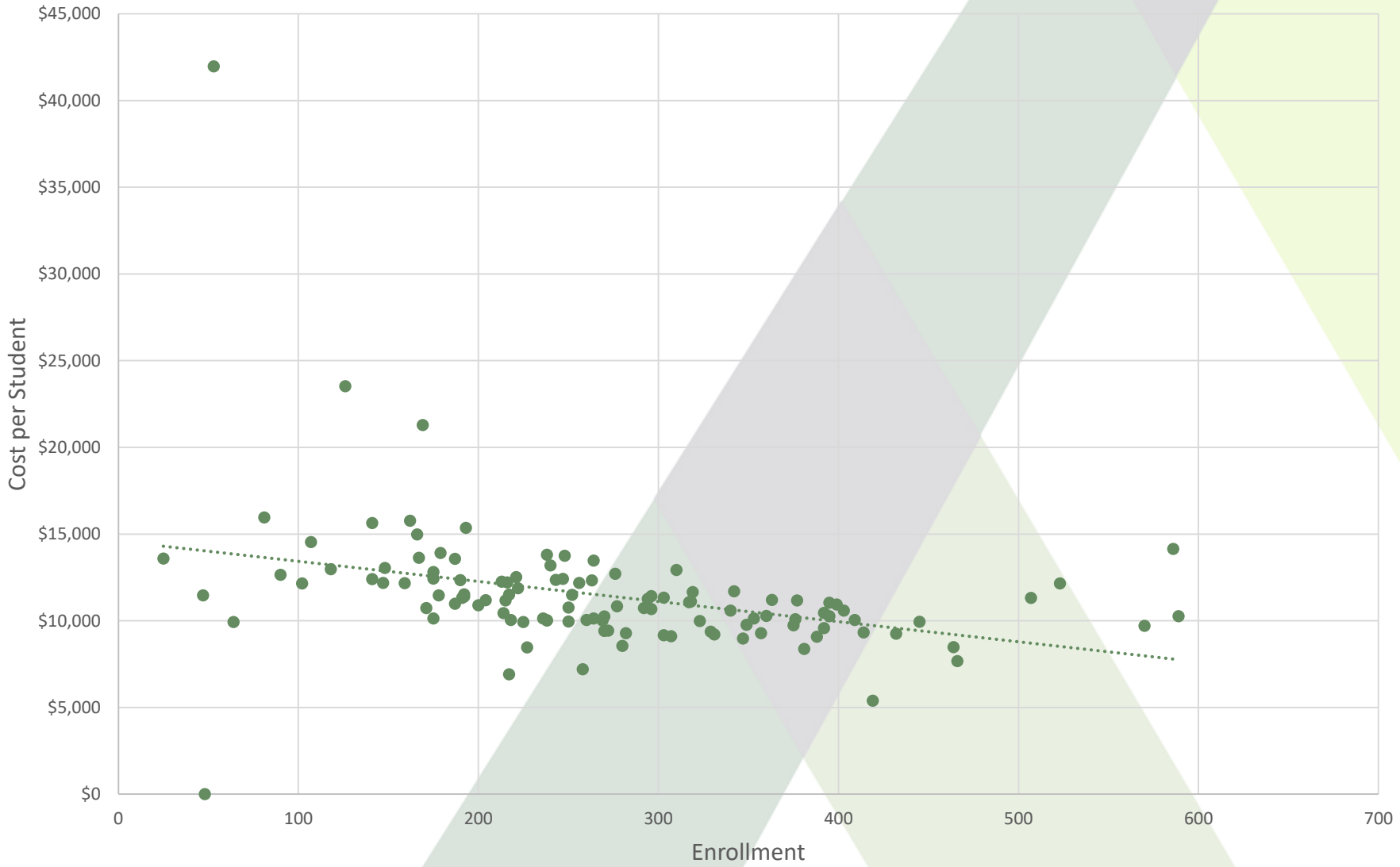
Appendix – School Size Analysis

Category	Slides
Operational Efficiency	95-97
Dropouts and Withdrawals	98-100

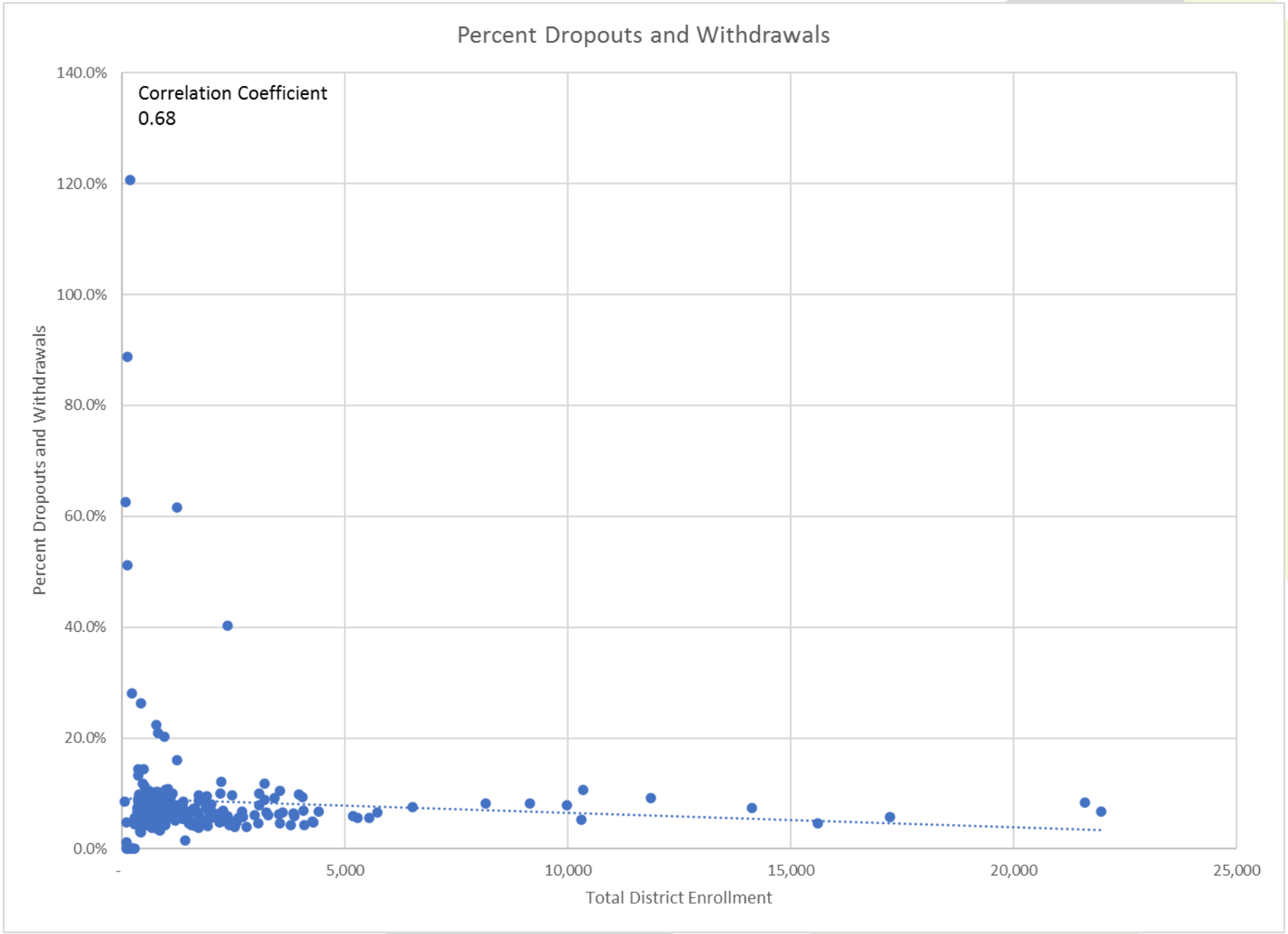
Operational Efficiency – School Size

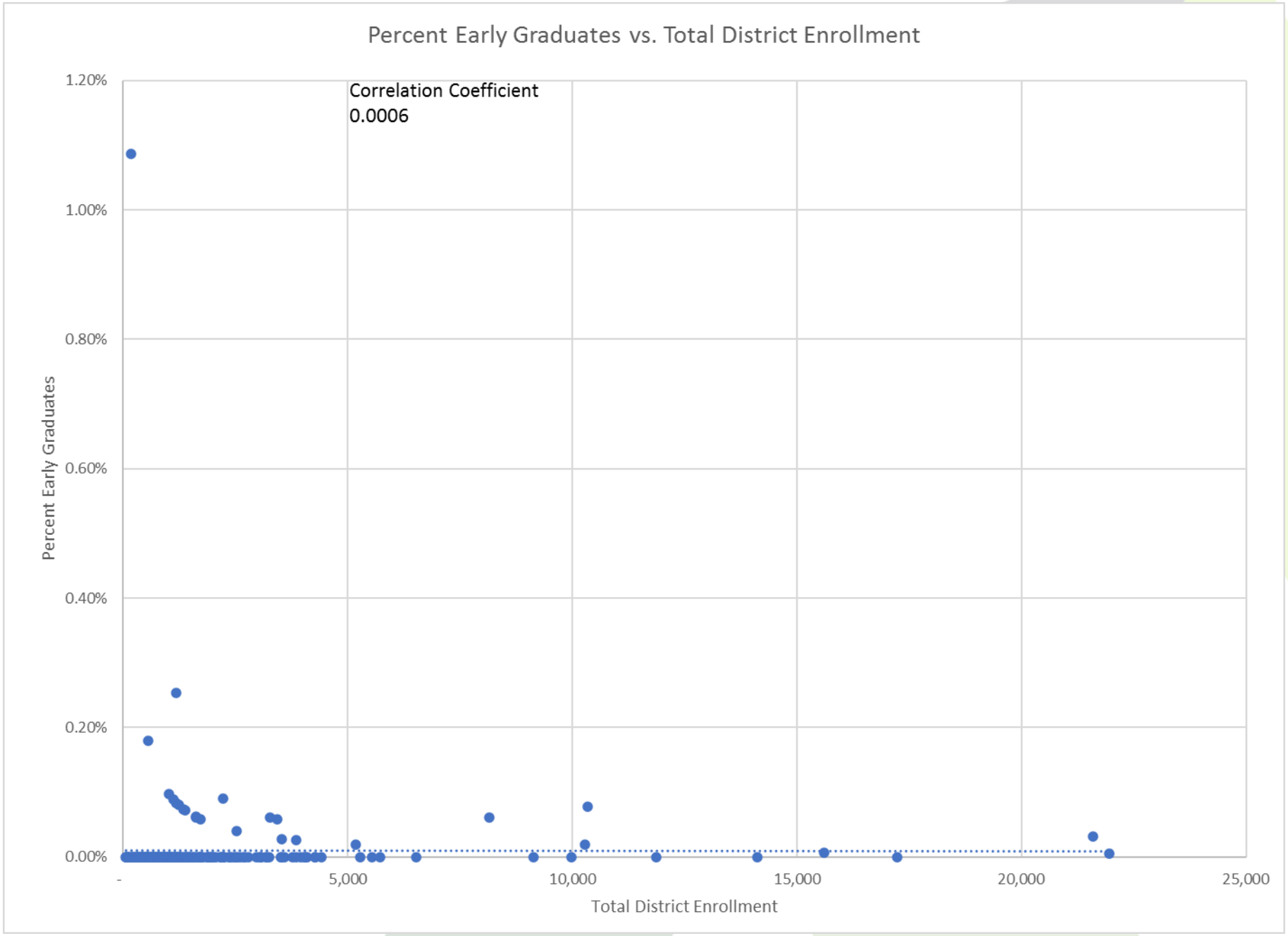

Cost per Student Grade 6 to 8 Middle Schools
60 schools, Correlation coefficient -0.0025
$18,000
$16,000
$14,000
$12,000
$10,000
$8,000
$6,000
$4,000
$2,000
$0
0
200
400
600
800
1000
1200
1400
1600
1800
2000

Cost per Student, Grade 7 to 12 High Schools
116 Schools, correlation coefficient -0.3457



Dropouts and Withdrawals


Percent Dropouts and Withdrawals
Correlation Coefficient
0.68
140.0%
120.0%
100.0%
80.0%
60.0%
40.0%
20.0%
0.0%
Percent Dropouts and Withdrawals
-
5,000
10,000
15,000
20,000
25,000
Total District Enrollment


Percent Early Graduates vs. Total District Enrollment
Correlation Coefficient
0.0006
1.20%
1.00%
0.80%
0.60%
0.40%
0.20%
0.00%
Percent Early Graduates
-
5,000
10,000
15,000
20,000
25,000
Total District Enrollment