



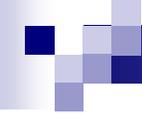
Preliminary Analysis

The Cost and Characteristics of Maine's Higher Performing Public Schools

Presented to
Joint Standing Committee on Education and Cultural Affairs
Maine State Legislature

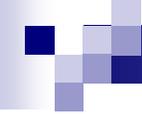
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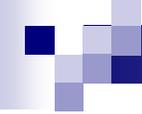
Goal

The goal of Maine's Essential Programs and Services Model is to insure that all schools have the programs and services that are essential if all students are to have equitable educational opportunities to achieve Maine's *Learning Results*.



Fundamental Premises of Essential Programs and Services

- There must be adequate resources to achieve desired outcomes.
- There must be equity in the distribution of adequate resources.



EPS Isolated Small School Adjustment Mainland Schools

Isolated Small Elementary Schools

- Qualifications:
 - a. Fewer than 15 students per grade level.
 - b. Number of school options available fewer than 5.
 - c. Nearest school is more than 8 miles away.
- Adjustment:
 - a. 10% transition adjustment to K-8 EPS rate for 2005-06.

EPS Isolated Small School Adjustment Mainland Schools

Isolated Small Secondary Schools

- Qualifications:
 - a. Fewer than 200 students per school.
 - b. Distance from furthest point in the district to nearest high school is at least 18.5 miles.
 - c. Distance between the high school and nearest high school is more than 10 miles.
- Adjustment:
 - a. Student-teacher ratios reduced to 11:1 for schools with fewer than 100 students and 13:1 for school with 100-199 students.

EPS Isolated Small School Adjustment Island Schools

■ Qualifications:

- a. Islands operating schools or transporting students to mainland schools.

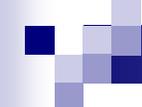
■ Adjustment:

- a. Isolated small secondary schools student-teacher adjustment for high schools with fewer than 200 students.
- b. 10% transition adjustment in K-8 EPS rate for elementary schools
- c. 13%-26% adjustment to EPS operating and maintenance costs, depending upon school level and size, for islands operating schools.
- d. Transportation adjustment equal to approved transportation expenditures.

Review of High-Performing and Cost-Effective Schools

(PL05, c.12, (LD468), Sec. UU-6)

The Maine Education Policy Research Institute within the University of Southern Maine shall conduct a review of high-performing and cost-effective small schools in the State. The steering committee of the Maine Education Policy Research Institute shall include a targeted research project to the fiscal year 2005-06 work plan to permit the principal investigators of the Maine Education Policy Research Institute to provide such technical assistance as may be required to complete this study. The Maine Education Policy Research Institute may receive input from the Joint Standing Committee on Education and Cultural Affairs regarding the expectations of the Legislature with respect to the completion of this study. Based upon its analyses, the Maine Education Policy Research Institute shall develop models of small schools that are both high-performing and cost-effective. The Maine Education Policy Research Institute shall report its findings and recommendations, including the characteristics of high performing and cost-effective small schools and proposed adjustments to the cost components of the Essential Programs and Services Funding Act, to the Joint Standing Committee on Education and Cultural Affairs...

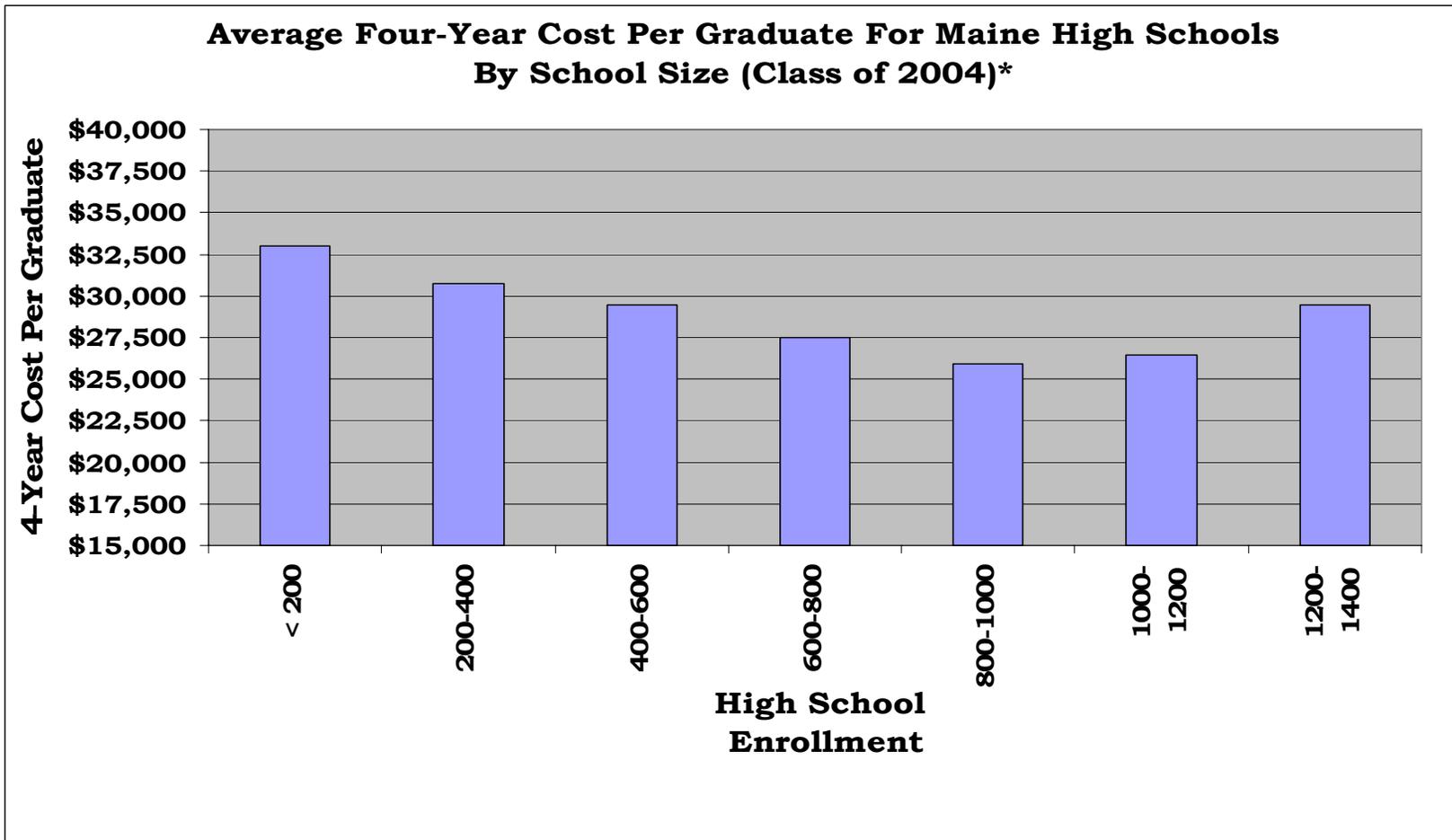


Four-Phase Study of Maine Schools

- Phase 1:** An examination of the applicability to Maine of some fairly widely held assumptions about the benefits of small schools.
- Phase 2:** The identification of higher performing Maine schools, of all sizes.
- Phase 3:** A calculation of the cost of different size higher performing schools in Maine.
- Phase 4:** An analysis of characteristics of higher performing Maine schools.

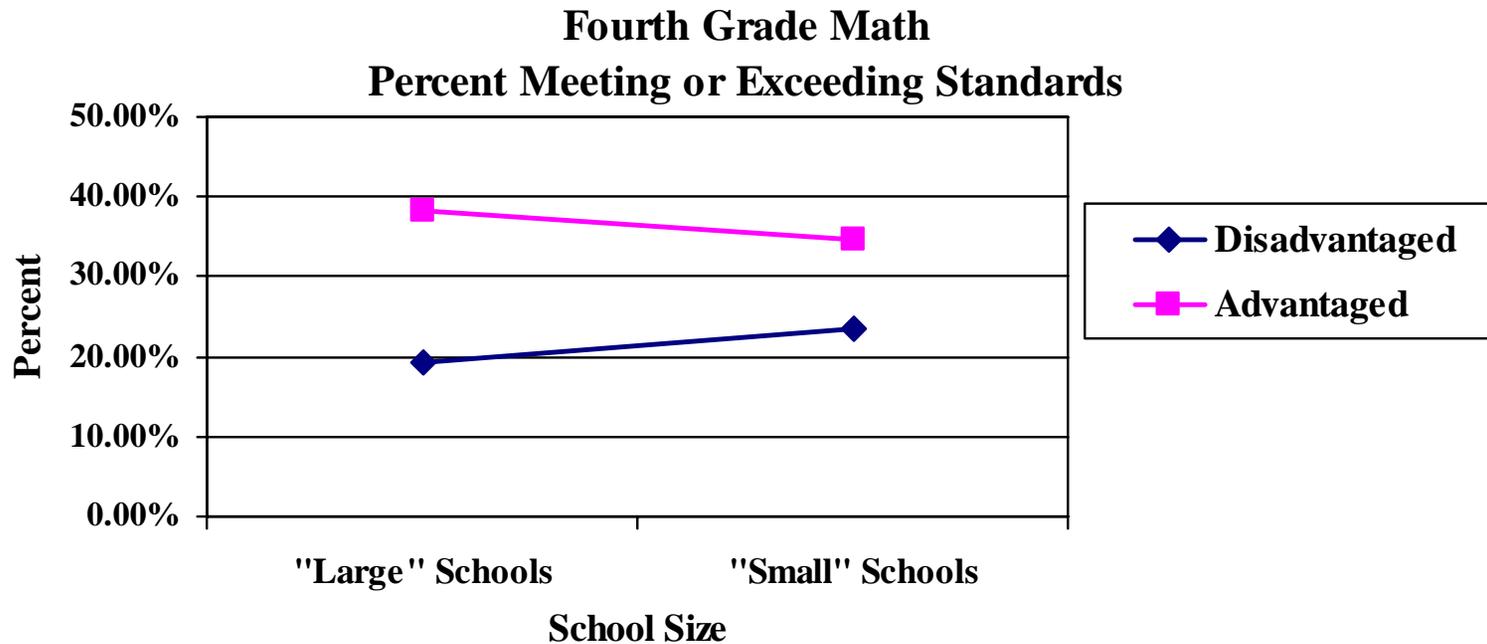
Phase 1: Analyzing Maine's Schools by Size

Analysis A: Calculation of Average Cost per Graduate



Phase 1: Analyzing Maine's Schools by Size

Analysis B: Analysis by Economically Advantaged and Disadvantaged Students



Economically	"Large" Schools	"Small" Schools
Disadvantaged	19.29%	23.62%
Advantaged	38.31%	34.68%

Phase 1: Analyzing Maine's Schools by Size

Analysis C: Analysis of Relationship Between School Size and Other Characteristics

Elementary School Performance and Cost Information

Average Grade Size	MEA		Cost	
	Average	Range	Average	Range
Less than 15	531.1	524.3 - 537.5	\$6,841	4,047 - 12,081
15-26	530.2	523.8 - 539.8	\$5,960	4,135 - 9,029
27-39	531.1	523.8 - 536.0	\$5,682	4,329 - 7,011
40-56	531.5	525.8 - 538.5	\$5,763	4,100 - 7,215
57 or more	532.0	527.0 - 538.3	\$5,682	4,369 - 7,804
All sizes	531.2		\$5,930	

Phase 1: Analyzing Maine's Schools by Size

Analysis C: Analysis of Relationship Between School Size and Other Characteristics

Elementary School Culture*

Average Grade Size	Student Tardiness	Student Absenteeism	Student Bullying	Fighting / Violence	Students' Motivation to Learn	Lack of parental involvement
Less than 15	0%	16.7%	8.3%	8.3%	25.0%	16.7%
15 – 26	31.3%	18.8%	18.8%	6.3%	37.6%	50.1%
27 – 39	18.8%	12.5%	12.5%	0%	23.0%	25.1%
40 – 56	14.3%	14.3%	14.3%	7.1%	35.7%	28.6%
57 or more	6.7%	14.3%	6.7%	0%	20.0%	26.7%

*Data from the 2005 Maine Public School Census Survey

Phase 2: Identification of Higher Performing Maine Schools

To qualify as a higher performing school, the school must:

1. have three year average MEA performance substantially above the state average;
2. have MEA performance substantially higher for both economically advantaged and disadvantaged children;
3. have MEA performance substantially higher than expected by community characteristics (value-added criteria); and
4. include sufficient grades for attributing MEA performance.

The same criteria, but in opposite directions, were used in identifying lower performing schools (e.g., MEA scores substantially below the state average, etc.)

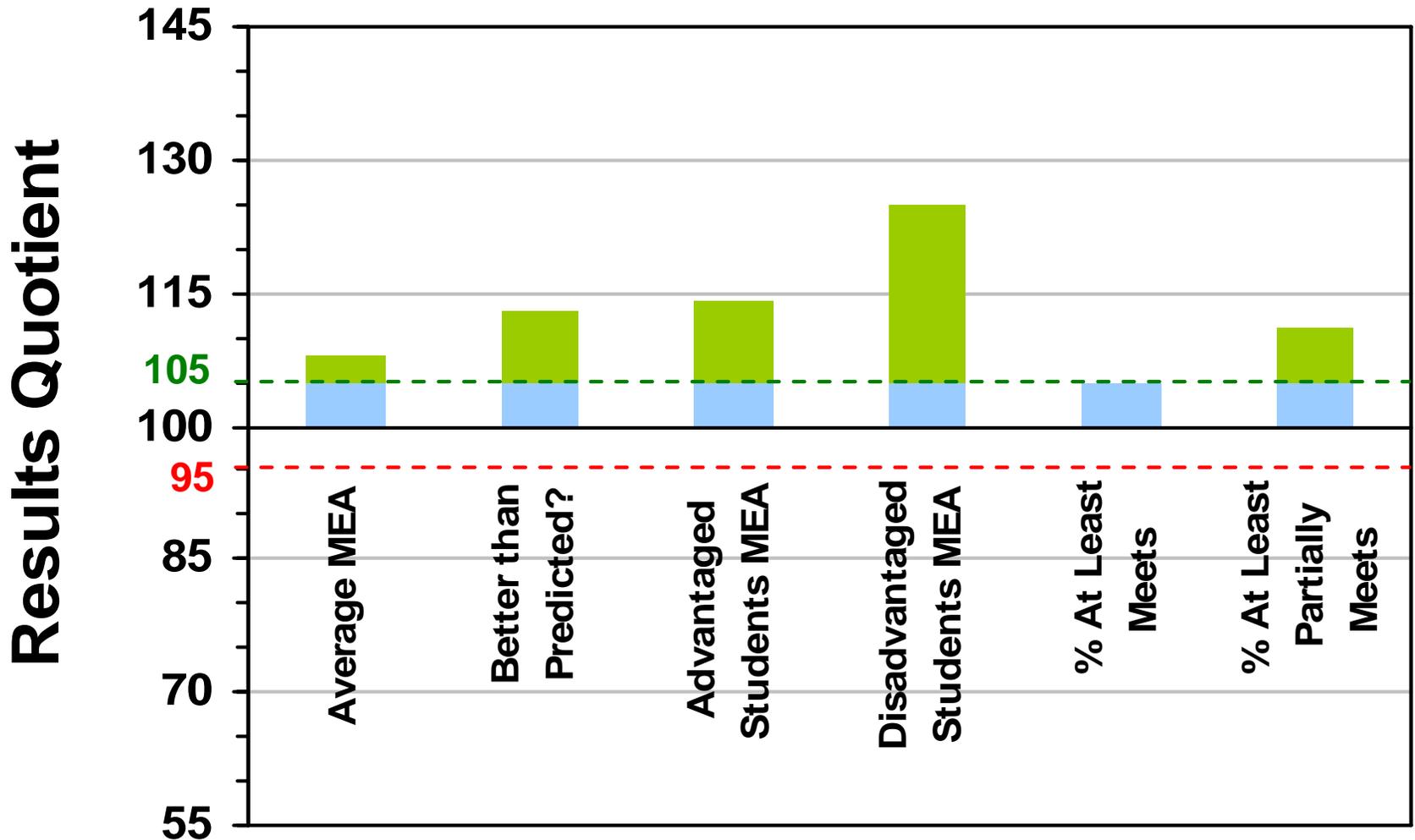
Note: It should be noted that the application of these criteria to identify higher performing Maine schools was for research purposes only. The State of Maine has not officially established any set of criteria for defining higher and lower performing schools, nor has the State specifically endorsed the definitions and criteria used in this research study.

Higher and Lower Performing Maine Schools

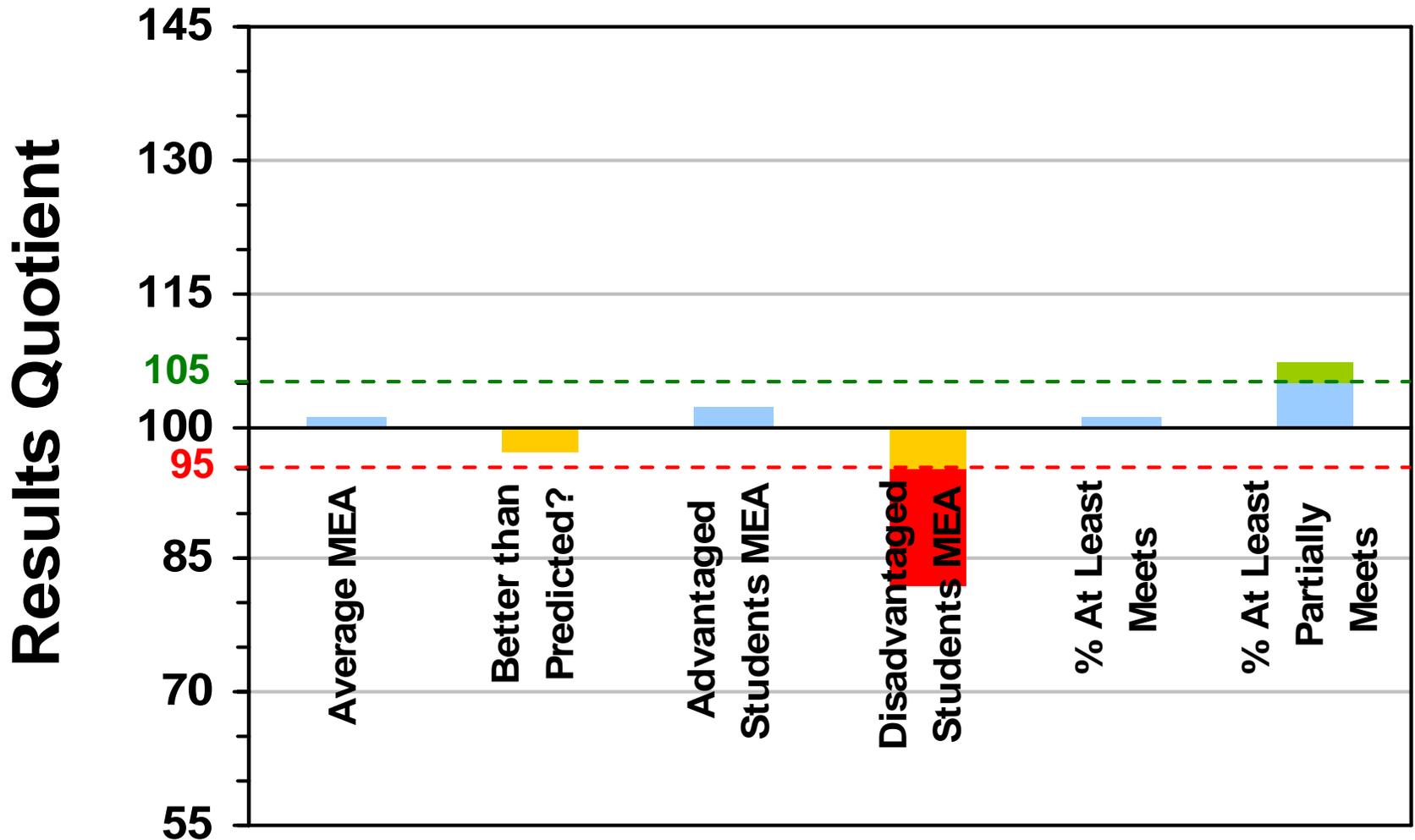
School Level	Number of Schools	Higher Performing	Range in School Size	Lower Performing	Range in School Size
High School (9-12)	118	14 (11.9%)	99-1479	22 (18.6%)	102 – 1136
Middle School (6-8)	94	15 (16.0%)	165-794	21 (22.3%)	28 – 718
Grade School (K-5)	188	45 (23.9%)	59-697	43 (22.9%)	48 – 642
K-8 School	98	19 (19.4%)	65-522	18 (18.4%)	85 – 474
Total	498	93 (18.7%)	59-1479	104 (20.9%)	28 - 1136

Major Finding: The analysis clearly reveals that higher performing schools, as well as lower performing schools, come in all sizes. Some of each type of school are small, and some of each type are among the largest schools in Maine.

Sample High School 1: Higher Performing

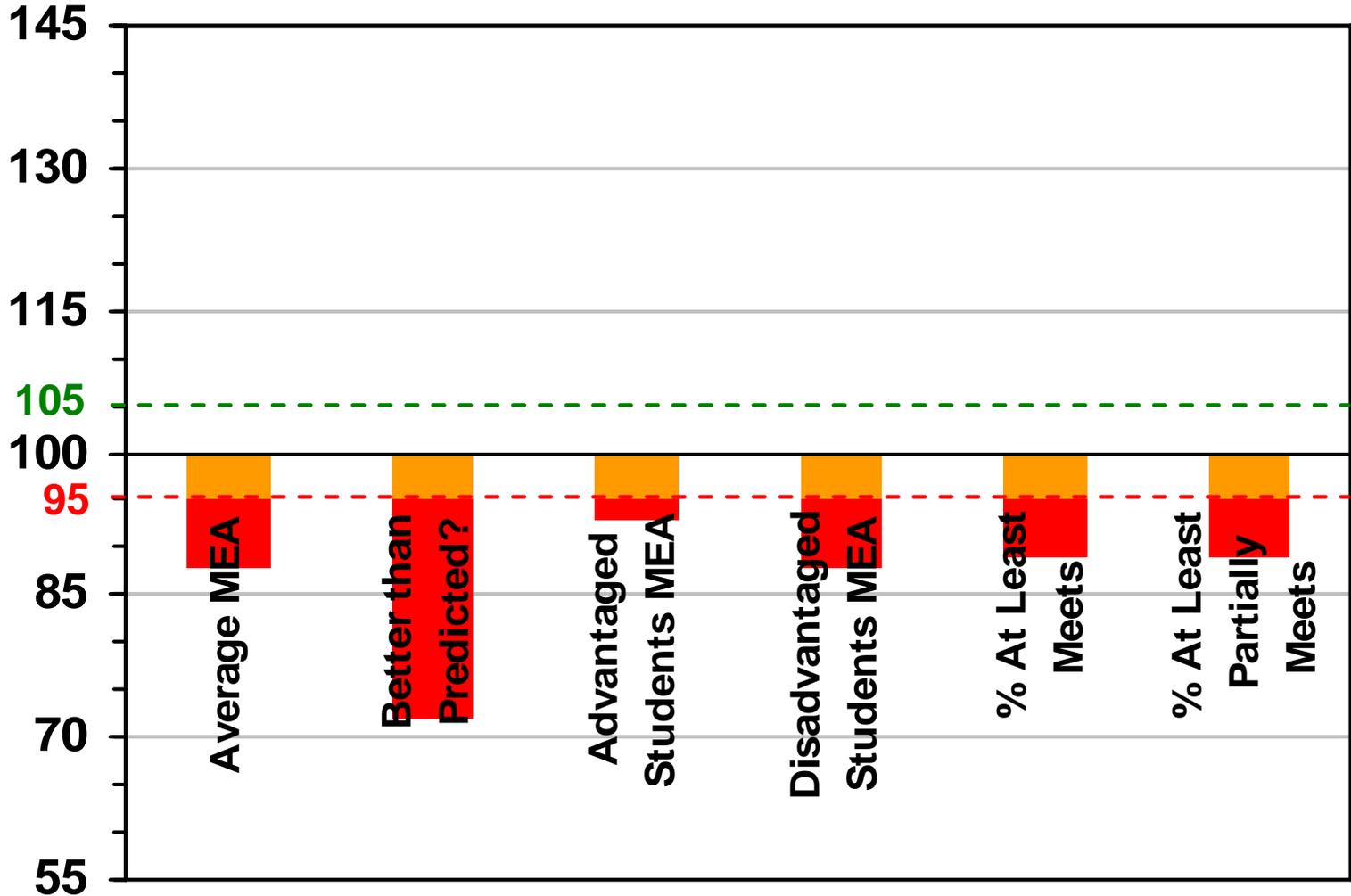


Sample High School 2: Neither Higher Nor Lower Performing



Sample High School 3: Lower Performing

Results Quotient



Phase 3: Calculating the Cost of Higher Performing Maine Schools

School level costs were calculated using an expenditures allocation process:

- Three year average personnel costs were assigned to each school based on MDOE staff data file, and adjusted for experience and education levels, and regional differences.
- All other applicable SAU expenses were converted to a per pupil amount and assigned to SAU schools based on enrollments.

Cost Analysis for Grade Schools[†]

Average Grade Size	Number of Schools			Mean 3-Year Per-Pupil Allocated Expense, Adjusted for Teacher Education & Experience and Region		
	Higher-Performing	Lower-Performing	All Schools	Higher-Performing	Lower-Performing	All Schools
Less than 15	9	7	28	\$6,699	\$6,762	\$6,694
15 – 29	6	12	45	\$6,428	\$5,744	\$5,957
30 – 49	13	11	53	\$5,650	\$5,668	\$5,653
50 or more	16	13	55	\$5,852	\$5,805	\$5,704
All Sizes	44	43	181	\$6,044	\$5,909	\$5,905

† Includes EK/K-4, EK/K-5, EK/K-6, EK/K-7, 1-4, 1-5, 1-6, 2-4, 2-5, 2-6, but not EK-8 or K-8 schools. Island schools are excluded.

Cost Analysis for Grade Schools

Some major observations:

- When all school size categories are considered, generally smaller school size categories are more costly, but not always (e.g., sizes 30-49 and 50 or more).
- Overall, higher performing schools are slightly more expensive than lower performing schools (i.e., \$6,044 vs. \$5,909; 2.3% difference), but not in all school size categories (e.g., less than 15 or 30 - 49).
- The smallest school size higher performing schools (less than 15 students per grade level) are approximately 13.4% more expensive than all school sizes (i.e., \$6,699 vs. \$5,905).
- Higher performing schools with 15-29 students per grade level are 8.8% more expensive than all school sizes (i.e., \$6,428 vs. \$5,905).

Cost Analysis for Elementary K-8 Schools[†]: 8th Grade Performance

Average Grade Size	Number of Schools			Mean 3-Year Per-Pupil Allocated Expense, Adjusted for Teacher Education & Experience and Region		
	Higher-Performing 8 th Grade	Lower-Performing 8 th Grade	All Schools	Higher-Performing 8 th Grade	Lower-Performing 8 th Grade	All Schools
Less than 15	7	8	36	\$6,870	\$7,063	\$7,162
15 – 29	8	5	36	\$7,068	\$5,986	\$6,645
30 or more	4	2	22	\$6,017	\$5,006	\$5,678
All Sizes	19	15	94	\$6,774	\$6,430	\$6,617

† Also includes EK-8 schools. Island schools are excluded.

Cost Analysis for Elementary K-8 Schools: 8th Grade Performance

Some major observations:

- When all school size categories are considered, smaller school size categories are more costly.
- Overall, the cost of higher performing schools is similar to the cost of all schools (i.e., \$6,774 vs. \$6,617; 2.4% difference).
- The smallest category of higher performing schools cost, relatively speaking, only 3.8% more than the average cost for all schools; and the next largest size grouping (15-29 students per grade) cost only 6.8% higher than the average cost of all schools.

Cost Analysis for Elementary K-8 Schools[†]: 4th and 8th Grade Performance

Average Grade Size	Number of Schools			Mean 3-Year Per-Pupil Allocated Expense, Adjusted for Teacher Education & Experience and Region		
	Higher-Performing 4 th and 8 th Grade	Lower-Performing 4 th and 8 th Grade	All Schools	Higher-Performing 4 th and 8 th Grade	Lower-Performing 4 th and 8 th Grade	All Schools
Less than 15	3	3	36	\$7,422	\$7,357	\$7,162
15 – 29	3	3	36	\$6,426	\$5,232	\$6,645
30 or more	2	1	22	\$5,584	\$5,364*	\$5,678
All Sizes	8	7	94	\$6,589	\$6,162	\$6,617

† Also includes EK-8 schools. Island schools are excluded.

* Single school

Cost Analysis for Elementary K-8 Schools: 4th and 8th Grade Performance

Some major observations:

- The cost of the smaller category of higher performing schools is 12.2% above the cost of all schools (i.e., \$7,422 vs. \$6,617).
- The cost of higher performing schools with an average of 15-29 students per grade level is approximately 3% less than the cost of all schools (i.e., \$6,426 vs. \$6,617).

Cost Analysis for Middle Schools[†]

Average Grade Size	Number of Schools			Mean 3-Year Per-Pupil Allocated Expense, Adjusted for Teacher Education & Experience and Region		
	Higher-Performing	Lower-Performing	All Schools	Higher-Performing	Lower-Performing	All Schools
Less than 68	2	5	16	\$6,690	\$6,357	\$5,873
68 – 96	2	4	16	\$5,146	\$5,822	\$5,703
97 – 132	3	3	19	\$6,178	\$6,006	\$6,001
133 – 199	5	4	17	\$5,810	\$6,004	\$6,103
200 or more	3	3	20	\$4,833	\$5,206	\$5,418
All Sizes	15	19	88	\$5,917	\$5,933	\$5,811

† Includes 4-8, 5-8, 6-8, 7-8 schools. Island schools are excluded.

Cost Analysis for Middle Schools

Some major observations:

- All middle schools may be considered moderate in size.
- The average per pupil expenditure varies very little between school size categories.
- In some cases higher performing schools are more expensive (e.g., less than 68) and sometimes lower performing schools are more expensive (e.g., 68-96 students).
- There is no clear pattern of expenses between different school size categories.

Cost Analysis for High Schools[†]

Average Grade Size	Number of Schools			Mean 3-Year Per-Pupil Allocated Expense, Adjusted for Teacher Education & Experience and Region		
	Higher-Performing	Lower-Performing	All Schools	Higher-Performing	Lower-Performing	All Schools
Less than 200	1	4	9	\$12,456*	\$8,697	\$8,861
200 – 349	2	7	24	\$7,049	\$8,698	\$7,787
350 – 599	4	5	27	\$7,494	\$6,657	\$7,201
600 – 849	4	4	20	\$6,408	\$6,380	\$6,568
850 or more	2	1	23	\$6,219	\$5,868*	\$6,086
All Sizes	13	21	103	\$7,277	\$7,636	\$7,110

† Includes 7-12, 8-12, 9-12 schools. Island and alternative schools are excluded.

* Single school.

Cost Analysis for High Schools

Some major observations:

- When all school size categories are considered, per pupil expenditures consistently increase with smaller size schools.
- Overall, lower performing schools are more expensive than higher performing schools (i.e., \$7,636 vs. \$7,277; 4.9% difference).
- For some school sizes, higher performing schools are more expensive than lower performing schools (e.g., sizes 350-599, 850 or more).
- Because there is only one higher performing school with less than 200 students, and because the cost of this school is skewed, it is difficult to determine the cost of the smallest high schools.



Identification of Characteristics of Higher Performing Schools

Four data sources were used in the characteristics analysis:

1. Data submitted by SAUs to the Maine Department of Education in the areas of staffing, school demographics, and expenditures.
2. Survey data submitted by students and schools as part of the yearly Maine Education Assessment (MEA) program.
3. School resource survey data provided by Maine school principals (MEPRI).
4. Student Speak II survey data provided by middle and high school students to the National Center for Student Aspiration (University of Maine).



Identification of Characteristics of Higher Performing Schools

Limitations of data:

1. Limited amount of data.
2. Accuracy of data is questionable in some cases.
3. Small number of schools in school size groupings.

Distinguishing Characteristics of Higher Performing Schools: Context Characteristics* *

Characteristic	K-5 Grade Schools	K-8 Grade Schools	Middle Schools	High Schools
1. Enrollment	N.D.	N.D.	*Larger	*Larger
2. Percent Free & Reduced Lunch	*Lower	N.D.	*Lower	*Lower
3. Percent Special Education	N.D.	*Lower	*Lower	N.D.
4. Teacher Salaries	*Lower	N.D.	N.D.	*Lower
5. Average Expenditure per Pupil	N.D.	N.D.	N.D.	N.D.

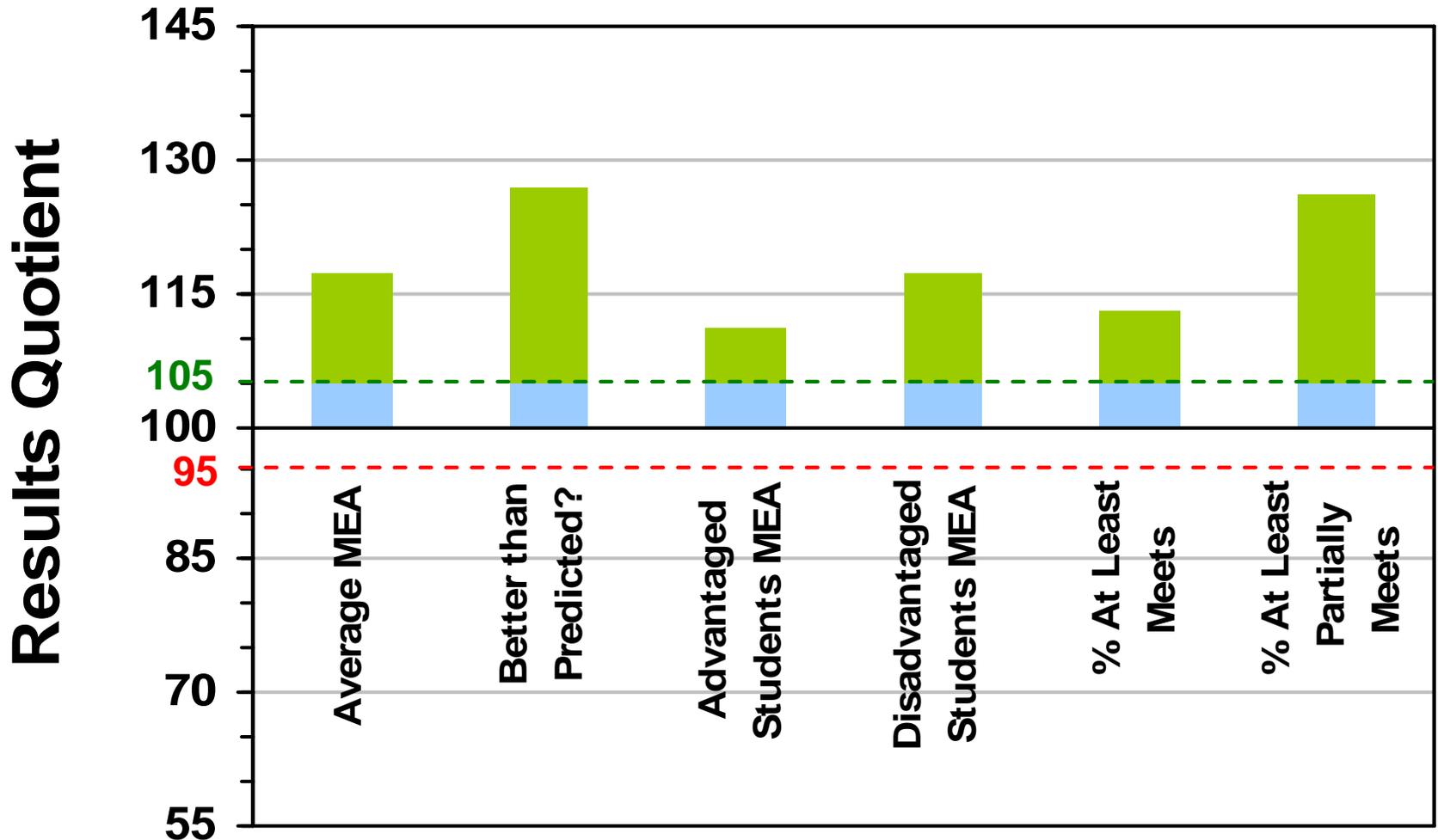
**Key: * = Effect size in favor of higher performing schools.

N.D. = No difference between higher and lower performing schools.

NA = Not Applicable.

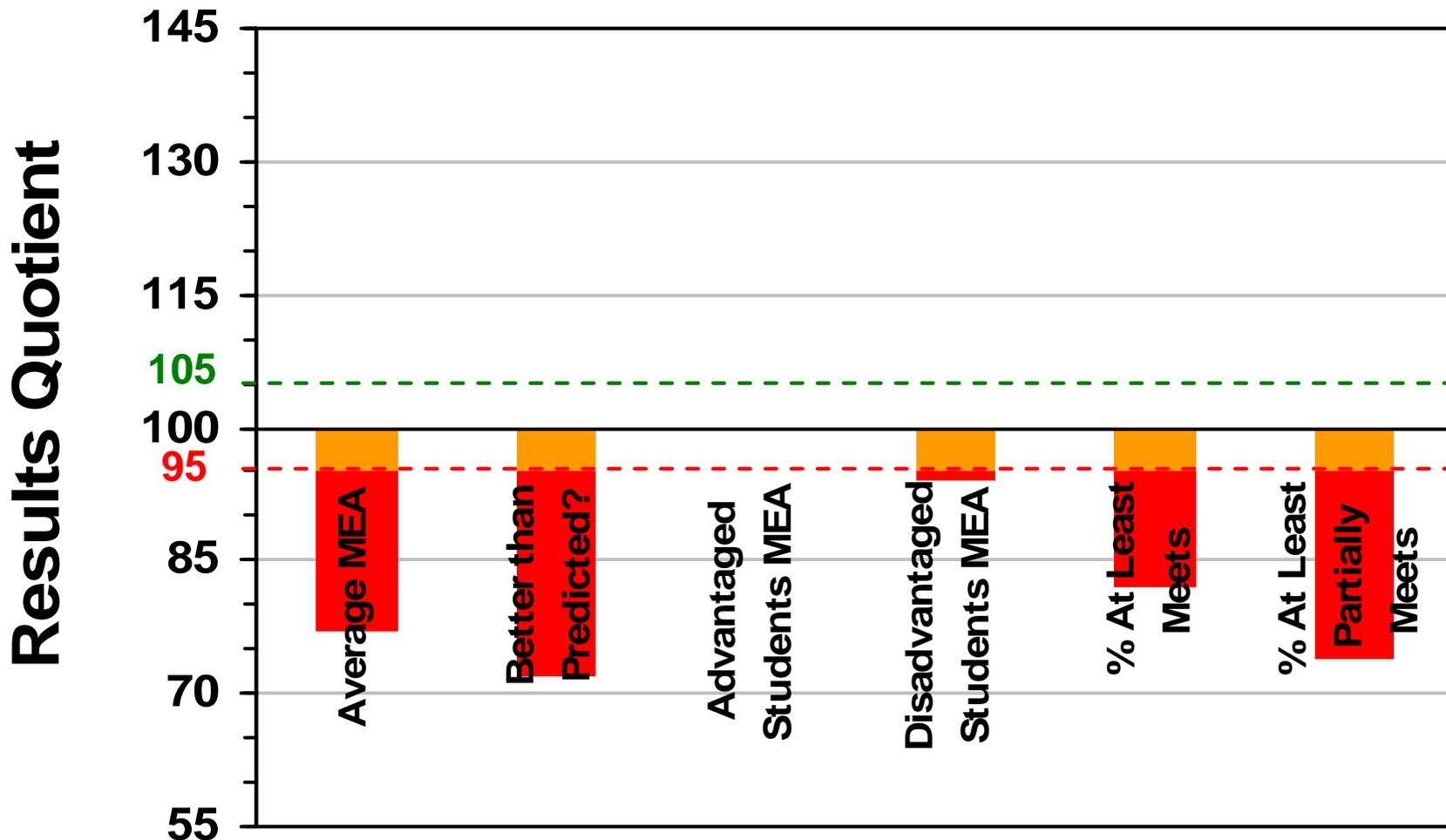
Sample Higher Performing High School:

47% F/R Lunch; 11 % Special Education
≈300 Pupils; ≈\$8,800 Per-Pupil Expense



Sample Lower Performing High School:

46% F/R Lunch; 14% Special Education
≈300 Pupils; ≈\$10,800 Per-Pupil Expense



Distinguishing Characteristics of Higher Performing Schools: Resources

Characteristic*	K-5 Grade Schools	K-8 Grade Schools	Middle Schools	High Schools
1. Teacher Experience	*Longer	N.D.	N.D.	*Longer
2. Teacher Education Level (MS or MS+)	N.D.	N.D.	*Higher	*Higher
3. Percent High Qualified Teachers	N.D.	N.D.	*Higher	*Higher
4. Pupil-Teacher Ratio	N.D.	N.D.	N.D.	N.D.
5. Administrator-Teacher Ratio	N.D.	*Lower	N.D.	N.D.
6. Total Instructional Time	*More	N.D.	N.D.	N.D.
7. Instructional Time in Mathematics	N.D.	N.D.	N.D.	NA
8. Instructional Time in ELA	*More	*More	*More	NA
9. Total Professional Development Time	*More	*More	N.D.	*Less
10. Course Completion Patterns	NA	NA	*More *Deeper	*More *Deeper
11. Amount of Homework	N.D.	N.D.	*More	*More
12. Read at Home	*More	*More	*More	*More
13. Curriculum Match MEA	*More	*More	*More	*More
14. Academics Important in School	NA	NA	*More Important	*More Important
15. Arts Important in School	NA	NA	N.D.	*More Important
16. Sports Important in School	NA	NA	N.D.	*Less Important

Distinguishing Characteristics of Higher Performing Schools: Outcomes

Characteristic*	K-5 Grade Schools	K-8 Grade Schools	Middle Schools	High Schools
1. MEA Scale Score	*Higher	*Higher	*Higher	*Higher
2. SAT Math Score	NA	NA	NA	*Higher
3. SAT Verbal Score	NA	NA	NA	*Higher
4. Percent Taking AP Courses	NA	NA	NA	*Higher
5. Percent Passing AP Exam Scores	NA	NA	NA	*Higher
6. Dropout Rate	NA	NA	NA	*Lower
7. Graduation Rate	NA	NA	NA	*Higher
8. Intend to go to College	NA	NA	NA	*Higher

Major Conclusions

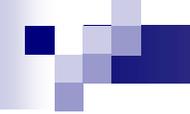
- The sizes of Maine public schools do not determine success.
- Schools of all sizes may be successful.
- Approximately 20% of Maine's public schools may be considered higher performing and performing beyond expectations.
- The cost of higher performing smaller schools is greater at some elementary levels.
- Higher performing schools emphasize academics and performance.
- More in depth knowledge of the distinguishing characteristics of higher performing schools is needed.

Recommendations

1. The State should develop a long-range policy and plan for addressing declining student populations, declining school sizes and school academic performance.
2. The State should endorse a short-term policy for ensuring equal education opportunities for students in smaller isolated Maine public schools. This policy should be:
 - a. Continuing present policy governing small isolated high schools and all island schools.
 - b. Increased allocation for smaller isolated lower grade level schools as follows:
 1. 13.4% for non-K-8 schools with less than 15 students per grade level.
 2. 8.8% for non-K-8 schools with 15-29 students per grade level.
 3. 12.2% for K-8 schools with less than 15 students per grade level.

Recommendations

- c. Continuation of increased allocations for individual schools should be contingent upon:
 - 1. Implementation of plans to achieve or maintain higher academic performance status.
 - 2. Making substantial yearly progress toward achieving or maintaining higher academic performance status.
- 3. The short-term policy should be enacted for a three year period beginning 2006-07.
- 4. The State should implement a plan for identifying distinguishing characteristics of higher performing Maine public schools and disseminating this information to all SAUs.



The full report and PowerPoint presentation
are available on our website:

<http://www.usm.maine.edu/cepare>

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