



REVIEW OF *THE PRODUCTIVITY OF PUBLIC CHARTER SCHOOLS*

Reviewed By

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August 2014

Summary of Review

This report claims superiority of charter schools in producing achievement per dollar invested. The findings are cast as cost-effectiveness ratios, where effects are measured by National Assessment of Educational Progress (NAEP) points and costs are measured as “revenues received.” The report concludes that charter schools deliver an additional 17 NAEP points per \$1000 in math and 16 points per \$1000 in reading. All analyses are undertaken with data for 21 states and the District of Columbia. Because an earlier review by Baker pointed to serious flaws in the “cost” part of the ratio, this review will focus on achievement. The effects of charter versus traditional public schools are estimated by comparing state averages of both sectors without attempting to equate them on demographic variables like poverty (free lunch eligibility) or special-needs status. Not reported is the fact that the demographic differences between the two sectors are highly correlated with the estimates of differential effects; the sector with the higher percentage of poor pupils scores lower on the NAEP test. This failure alone renders the report and its recommendations indefensible. Furthermore, the assessment of expenditures in the two sectors rests on non-comparable data across states and questionable data within states. These weaknesses leave little evidence on which to base any valid conclusions. Reports of this type can only be viewed as advocacy research, in large part because they fail to reconcile their findings with the extensive literature of contrary findings.

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This is one of a series of Think Twice think tank reviews made possible in part by funding from the Great Lakes Center for Education Research and Practice. It is also available at <http://greatlakescenter.org>.

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REVIEW OF *THE PRODUCTIVITY OF PUBLIC CHARTER SCHOOLS*

Gene V Glass, Arizona State University

I. Introduction

On July 26, 2014, the University of Arkansas Center for Education Reform released a report addressing the relative productivity of charter schools as compared to traditional public schools. The report is entitled *The Productivity of Public Charter Schools*.¹ The report includes a main section in which the cost effectiveness of charter schools (CS) is compared to that of traditional public schools (TPS) for 21 states plus the District of Columbia and three Appendices in which various methods and data sources are described.

The authors of the report are as follows: 1) Patrick Wolf, Distinguished Professor of Education Policy and 21st Century Endowed Chair in School Choice in the Department of Education Reform at the University of Arkansas in Fayetteville; 2) Albert Cheng, a graduate student in the Department of Education Reform, referred to as a “Distinguished Doctoral Fellow”; 3) Meagan Batdorff, founder of Progressive EdGroup and a Teach for America alumna; 4) Larry Maloney, president of Aspire Consulting; 5) Jay F. May, founder and senior consultant for EduAnalytics; and 6) Sheree T. Speakman, founder and CEO of CIE Learning and former evaluation director for the Walton Family Foundation.

The report reviewed here is the third in a succession of reports on charter schools that have generally claimed that in relation to traditional public schools (TPS), charter schools (CS) are more effective in producing achievement² and less costly per pupil.³ The current report attempts to combine these attributes into an analysis of the cost effectiveness of CS versus TPS. Results are reported in terms of National Assessment of Educational Progress (NAEP) scores per \$1,000 expenditure at the state level for 21 states and the District of Columbia. The claim is made based on these analyses that charter schools, while spending far less per pupil than traditional public schools, generally produce achievement as good as or superior to that of traditional public schools.

The claims made in the report rest on shaky ground. The comparison of achievement scores between the CS and TPS sectors suffers from multiple sources of invalidity. The assessment of expenditures in the two sectors rests on questionable data. In the examination of cost effectiveness analyses, weaknesses in these two areas leave little evidence on which to base any valid conclusions. If one is calculating “bang for the buck,” what is left if neither the bang nor the buck can be believed?

II. Findings and Conclusions of the Report

Comparing NAEP achievement obtained in charter schools versus that in traditional public schools for 21 states and DC, the report concludes that the charter school sector delivers a weighted average of an additional 17 NAEP points per \$1000 invested in math, representing a productivity advantage of 40% for charters. The report goes on:

- In reading, the charter sector delivers an additional 16 NAEP points per \$1000 invested, representing a productivity advantage of 41% for charters;
- Percentage differences in cost effectiveness for charters compared to that for TPS in terms of NAEP math score points per \$1000 invested ranges from 7 percent (Hawaii) to 109 percent (Washington DC);
- Percentage differences in cost effectiveness for charters compared to that for TPS in terms of NAEP reading score points per \$1000 invested ranges from 7 percent (Hawaii) to 122 percent (Washington DC). (p. 7).

Curiously, in spite of report's executive summary touting the superior cost effectiveness of charter schools versus traditional public schools, the authors insert the following caveat in a later section:

... our cost effectiveness calculation using NAEP scores has important limitations. Most importantly, it is merely descriptive, not causal, because charter schools might be reporting higher NAEP scores per \$1000 invested than TPS because of the characteristics of students attracted to the charter school sector and not because they actually do a better job educating similar students and at a lower cost. (p. 21).

Virtually absent from the report are citations to works that dispute the position assumed by these authors, their academic affiliations, or their sponsors.

This caveat, which basically undercuts the conclusions and recommendations of the report, is missing from the press releases and media coverage.⁴

The report concludes with calculations of the superior lifetime earnings, labeled *Return on Investment (ROI)*, that accrue to pupils educated in charter schools when compared with those of pupils in traditional public schools. An example of a conclusion from this analysis follows:

The higher ROI [essentially lifetime earnings] for charters compared to TPS ranges from +0.4 percent (New Mexico) to +4 percent (Washington DC) assuming a single year of charter schooling and from 3 percent to 33 percent assuming a student spends half of their K-12 years in charters. (p. 7).

III. The Report's Rationale for Its Findings and Conclusions

The relative cost effectiveness of the two sectors, CS and TPS, is based on the examination of National Assessment of Educational Progress test score averages from those 21 states and the District of Columbia in which the average score is reported separately for the two sectors. Associated with these achievement test data are estimates of the per pupil expenditure in the two sectors for each state. The simple division of the average test score by the average expenditure at the level of the state is said to produce a cost-effectiveness ratio that can be compared between the two sectors. Such calculations are frequently described in basic textbooks,⁵ but they are rarely applied in the area of education due to the complexity of capturing both the outcomes of teaching and the expenditure of funds for instruction.⁶ One might as well ask, "What is the return on expending one's effort to improve one's marriage?"

IV. The Report's Use of Research Literature

Issues such as the relative costs and effectiveness of CS and TPS are hotly contested in the research literature of the past two decades.⁷ By and large, researchers have taken positions of advocacy and cited related work that supports their position while ignoring conflicting evidence. The present report continues that pattern. Virtually absent from the report are citations to works that dispute the position assumed by these authors, their academic affiliations, or their sponsors. While they do cite Bruce Baker's work that disputes their recent claims regarding the inequity of charter school funding⁸, they do so only in the context of what they regard as a refutation of its claims. That refutation is wanting and has been responded to by Baker.⁹ Just as important, a wide-ranging literature disputing the claim of superior effectiveness of charter schools is completely ignored.¹⁰

In the current case, the failure to reconcile the reported findings with a large literature of contrary evidence is particularly egregious. At this stage in the accumulation of research evidence, those who claim positive effects for charter schools in comparison with traditional public schools have a burden of proof to demonstrate that their research is not only sound but that the findings of prior research are somehow invalid.

V. Review of the Report's Methods

The main argument of the report hinges on the estimation of two things: 1) the relative performance on achievement tests of CS and TPS, and 2) the cost of educating the average pupil in CS versus TPS.

For the former estimate, the authors have chosen to use the average statewide scores in math and reading for those states that report NAEP scores for both sectors, CS and TPS for FY11. For the latter estimate, i.e., cost, the choice was made to use "revenues received"

rather than “expenditures made.” Relying on data from an earlier report,¹¹ the authors concluded that the “main conclusion of our charter school revenue study was that, on average, charter schools nationally received \$3,814 less in revenue per-pupil than did traditional public schools.” (p. 10). At this early point, the report’s analysis runs off the rails. Revenues received and actual expenditures are quite different things. Revenues received by traditional public schools frequently involve funds not even intended for instruction. The report purports to compare “all revenues” received by “district schools” and by “charter schools,” claiming that comparing expenditures would be too complex. The problem is that revenues for public schools often fund programs not provided by charter schools (special education, compensatory education, food, transportation, special populations, capital costs, state mandated instructional activities, physical education, and the like.) Charter funding is in most states and districts received by pass-through from district funding, and districts often retain some or all responsibility for the provision of services to charter school students—a reality that the report acknowledges but then does nothing to correct for in the data. There are huge variations across states and within states. This non-comparability problem alone invalidates the findings and conclusions of the study.

A sensible comparison of cost-effectiveness between the two sectors would require at a minimum a parsing of these expenditures that isolates funds spent directly and indirectly on instruction. No such parsing of revenues was even attempted in the present report. The report suggests the reader do this for their state(s) of interest.

By employing different spending definitions according to each state’s format (“State system of record”), comparability across states and aggregation of data is rendered meaningless. Nevertheless, the report both ranks and aggregates the non-comparable data in arriving at its conclusions. In Appendix B (p. 39), the report lists several comparability problems but these problems are ignored thereafter. The deficiencies in the work of the Department of Educational Reform with respect to funding that were addressed by Baker¹² have not been corrected. The report proceeds as if to mention a deficiency in data renders it inoperative.

The primary limitation on the availability of achievement data was whether a state had reported NAEP averages for both sectors, CS and TPS, separately. The District of Columbia and 21 states did so and were included in the analysis. NAEP data for grade 8 were employed in the analyses. However, NAEP tests are also administered at grades 4 and 12, though these data were ignored claiming that 4th grade NAEP scores would underestimate effects and 12th grade scores would overestimate them. This rationale is unclear, and by foregoing any analyses at the other two grades, the report passes on the opportunity to explore the robustness of their findings.

A cost effectiveness ratio was calculated by dividing the average NAEP score for a sector and a state by the average cost (per pupil revenue received in thousands of dollars) for a sector and a state. For example, for the state of Illinois, the average NAEP math score for TPS was 283 and the average per pupil revenue in thousands of dollars was \$6.73 yielding

a cost effectiveness ratio of $CE = 283/6.73 = 42$ NAEP points in math per \$1,000 of revenue.

The gist of the report's argument involved the comparison of cost effectiveness ratios between sectors. At this point, the logic and the validity of the research run into difficulties. The validity of the comparison of "effectiveness" (i.e., NAEP averages) depends on the truth of the counterfactual that if CS pupils had attended TPS, they would have scored where the TPS pupils scored on the NAEP test. (This is in fact the same as the logic of any valid, controlled comparative experiment.) In a slightly different context, the authors have presented data that argues against the truth of this counterfactual.

In attempting to refute claims by Miron¹³ and Baker¹⁴ that there are not big funding inequities between the two sectors, the report presents data on the percentages of Free or Reduced-Price Lunch (FRL) and Special Education (SP) pupils in each sector for each state. Baker had argued previously that the differential in revenues between CS and TPS was due in large part to the fact that the latter serve a greater percentage of pupils who are poor or who require special services. In their attempt to refute this claim, the authors assert:

The charter sectors in our study actually tend to enroll a higher percentage of low-income students than the TPS sectors, regardless of whether one uses free lunch or FRL as the poverty measure. The special education enrollment gap of just 3 percentage points is far too small to explain much of the charter school funding gap, even if many of the additional special education students in the TPS sector had the most severe, highest cost, disabilities imaginable. As our revenue study concluded, a far more obvious explanation for the large charter school funding gap is that state and local policies and practices deny public charter schools access to some educational funding streams . . . (p. 11).

In support of the claim that the charter schools in the study enroll more poor pupils and only slightly fewer special-needs pupils, the report presents Table 1 on page 12, which has been reproduced below.

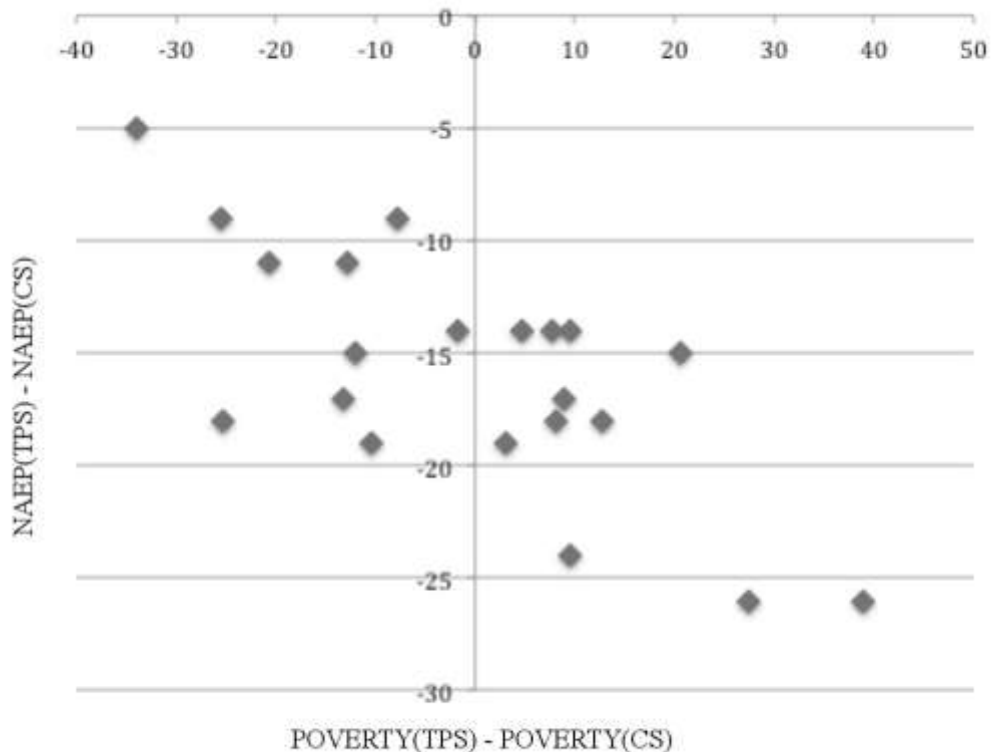
Of the 31 states in Table 1, only 22 were involved in the calculation of comparative cost effectiveness ratios, due to availability of NAEP data for both sectors. Of those 22 used to calculate cost-effectiveness ratios, 10 states had a higher proportion of poor (FL) pupils enrolled in CS than in TPS. In 11 states, TPS enrolled a higher percentage of poor pupils than did CS. (Hawaii had equal percentages in both sectors.) So for the purposes of calculating the comparative effectiveness of TPS vs CS, it is noteworthy that there are slightly more states in which TPS has a greater percentage of poor students than CS.

Table 1. Student Enrollment Characteristics in Charter and TPS Sectors
(After Wolf *et al.* [2014])

STATE	Free Lunch Students Only (%)			Free or Reduced-Price Lunch Students (%)			Special Education Students (%)		
	Charter	TPS	Δ^*	Charter	TPS	Δ^*	Charter	TPS	Δ^*
Illinois	73.5	39.5	34	79.9	44.9	35	14.4	13.1	1.3
Missouri	69.1	36.7	32.4	74	43.7	30.3	N/A	N/A	N/A
New Jersey	57.4	26.7	30.7	69.4	32.1	37.3	9.1	16.2	-7.1
Connecticut	55	28.8	26.2	67.6	33.7	33.9	7.2	11.4	-4.2
New York	66.5	40.6	26	77.3	47.5	29.8	N/A	N/A	N/A
Maryland	58.5	33	25.5	66.9	39.6	27.3	12	12.4	-0.4
Michigan	64.5	39.1	25.3	70	44.5	25.5	N/A	N/A	N/A
Minnesota	48.3	27.6	20.7	55.9	35.6	20.3	12.8	13.3	-0.5
Indiana	57.2	38.5	18.7	65.3	46.2	19.1	11.4	14.7	-3.3
Louisiana	74.3	58.5	15.9	80.1	65.4	14.7	N/A	N/A	N/A
Pennsylvania	45.7	32.4	13.2	54.5	38.1	16.4	N/A	15.2	N/A
Texas	56	43.1	12.9	72.2	60.8	11.4	11.1	10.8	0.3
Massachusetts	41.7	29.6	12.1	50.3	34.8	15.5	12.2	17.9	-5.7
Wisconsin	48.1	37.7	10.4	54.9	44.7	10.2	N/A	N/A	N/A
Ohio	44.4	36.5	7.8	48.1	42.2	5.9	14.1	14.9	-0.8
North Carolina	48.9	47.2	1.7	56.8	53.9	2.9	8.5	7.5	1
Hawaii	36.3	36.3	0	45	46.9	-1.9	8	10.1	-2.1
Arizona	32.3	35.4	-3.1	39.4	45.8	-6.4	8	12.3	-4.3
DC	63.1	67.8	-4.6	82.4	79.7	2.7	12.9	14.4	-1.5
Utah	23.5	31.3	-7.8	28.4	39	-10.6	10.8	11.1	-0.3
California	38.4	46.5	-8.1	46.8	54.3	-7.5	7.5	11.5	-4
Colorado	24.9	33.9	-9	30.7	40.8	-10.1	5.7	9.7	-4
Florida	39	48.5	-9.5	48.8	56.6	-7.8	N/A	N/A	N/A
Georgia	41.3	50.9	-9.6	48.6	57.6	-9	7.9	10	-2.1
Delaware	30.1	42.9	-12.8	37.8	48.5	-10.7	6.5	11	-4.5
Arkansas	33.3	50.1	-16.8	48	64.7	-16.7	5.4	11.6	-6.2
New Mexico	41.7	62.4	-20.7	48.3	68.5	-20.2	14.1	14.1	0
South Carolina	23.8	48.9	-25	30	55.1	-25.1	N/A	14.2	N/A
Idaho	10.2	37.6	-27.4	15.2	46.7	-31.5	N/A	N/A	N/A
Tennessee	11.7	48	-36.3	71.5	55.3	16.2	N/A	N/A	N/A
Oregon	12.8	51.8	-39	12.8	51.8	-39	N/A	N/A	N/A

* Δ is the difference between the two preceding columns

To further examine this bias, consider the relationship between the poverty (FL) differential between TPS and CS and the achievement (NAEP) differential. In Figure 1 below is presented the scatter plot relating the poverty differential to the achievement differential.



(Note: NAEP scores are for math. Hawaii data excluded as an outlier. Correlation = $-.72$)

Figure 1. Scatter plot of (Poverty[TPS]) – (Poverty[CS]) vs (NAEP[TPS]) – (NAEP[CS]).

The greater the incidence of poverty in TPSs than in CSs, the greater the CS advantage over the TPSs in achievement, as indicated by the strong negative relationship depicted in Figure 1 for math. In fact, the correlation coefficient between $POVERTY(TPS) - POVERTY(CS)$ and $NAEP(TPS) - NAEP(CS)$ is $-.72$ (excluding Hawaii which is an outlier in the scatter diagram). Thus, the productivity differentials between CS and TPS which constitute the numerator of the report’s cost effectiveness measure are confounded with differences in poverty between the two sectors, as one would expect. The same analysis for reading produces almost identical results with a correlation coefficient equal to $-.71$.

The implication of the strong negative correlation between the poverty differential and the NAEP score differential is that the effectiveness measure employed in the cost-effectiveness calculation is really a measure of the differences in poverty at the state level

between the charter school and the traditional public school sectors. It is well established that poverty level is one of the strongest influences on standardized test scores, even outweighing the influence of schooling itself in most instances.¹⁵

Data on the percentage of pupils in Special Education similarly show differences that would bias effectiveness estimates in favor of charter schools. Of 31 states and the District of Columbia, 16 states show a larger percentage of pupils classified as special needs in TPS than in CS; 4 show the reverse and 11 states did not have data available by sector. Of the 22 states employed in the report for cost effectiveness analysis, 12 showed higher percentages of special education pupils in TPS than in CS; 3 showed the reverse; one showed no difference and 6 have no data available by sector. The authors ignored the implications of these data to the validity of their comparisons of NAEP scores and instead attempted to discredit the special education discrepancy between the sectors as an explanation for the greater pupil revenues in TPS. (See p. 11 of the report.)

VI. Review of the Validity of the Findings and Conclusions

The very title of the report, *The Productivity of Public Charter Schools*, invites the interpretation that charter schools produce greater academic achievement at lesser cost. However, it is difficult and in many cases impossible to parse revenues into those that are directed at promoting academic learning and those that serve other purposes (e.g., administration, guidance, special services to disabled children and the like). Such parsing is particularly difficult in the charter school sector where accounting practices are often lax and transparency of expenditures is sometimes completely lacking. Thus, to argue that a simple arithmetic ratio of NAEP points and revenues describes a school's "productivity" is little more than a weak metaphor.

As noted above, the principal conclusions of the report are as follows:

- In reading, the charter sector delivers an additional 16 NAEP points per \$1000 invested, representing a productivity advantage of 41% for charters;
- Percentage differences in cost effectiveness for charters compared to that for TPS in terms of NAEP math score points per \$1000 invested ranges from 7 percent (Hawaii) to 109 percent (Washington DC);
- Percentage differences in cost effectiveness for charters compared to that for TPS in terms of NAEP reading score points per \$1000 invested ranges from 7 percent (Hawaii) to 122 percent (Washington DC). (p. 7).

The validity of these conclusions rests in essential ways on the estimates of relative effectiveness of TPS and CS as reflected in state average NAEP scores in math and reading. But these estimates have been shown to be seriously biased in favor of CS due to the non-comparability of the CS and TPS students (disadvantaging the TPS both in wealth and

incidence of special needs pupils). Moreover, the conflating of “revenues received” and “costs” to produce a given effect has reduced the reports exercise to little more than political arithmetic.¹⁶

It is astounding that the report offers a proviso concerning its findings while simultaneously proceeding as though the proviso had never been mentioned:

. . . our cost effectiveness calculation using NAEP scores has important limitations. Most importantly, it is merely descriptive, not causal, because charter schools might be reporting higher NAEP scores per \$1000 invested than TPS because of the characteristics of students attracted to the charter school sector and not because they actually do a better job educating similar students and at a lower cost. (p. 21).

By any reasonable interpretation of the language employed in the report, the calculations are put forward as a *description* of a *causal* claim. “Effectiveness” implies “effect” and in both common and academic parlance, effects are the results of causes. The report speaks out of both sides of its mouth, but only softly does it whisper limits while shouting the alleged superior productivity of charter schools.

VII. Usefulness of the Report for Guidance of Policy and Practice

The report continues a program of advocacy research that will be cited by supporters of the charter school movement. It can be expected to be mentioned frequently when arguments are made that charter schools deserve higher levels of funding. The report will be cited when attempts are made to refute research on the poor academic performance of charter schools. Nothing in the report provides any guidance to educators in either sector, CS and TPS, on how to improve the practice of education. Although the evidence reported provides no credible foundation for evaluating either the costs or the effectiveness of charter schools, it can be expected that the report will find frequent use by politicians and companies managing charter schools as they pursue their reform agenda.

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DOCUMENT REVIEWED:

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PUBLISHER/THINK TANK:

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DOCUMENT RELEASE DATE

July 24, 2014

REVIEW DATE:

August 19, 2014

REVIEWER:

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SUGGESTED CITATION:

Glass, G. V (2014). *Review of "The Productivity of Public Charter Schools."* Boulder, CO: National Education Policy Center. Retrieved [date] from <http://nepc.colorado.edu/thinktank/review-productivity-public-charter>.