

NEPC REVIEW: MONEY FOR NOTHING: THE RELATIONSHIP BETWEEN VARIOUS TYPES OF SCHOOL SPENDING AND ACADEMIC OUTCOMES (WISCONSIN INSTITUTE FOR LAW AND LIBERTY, AUGUST 2018)



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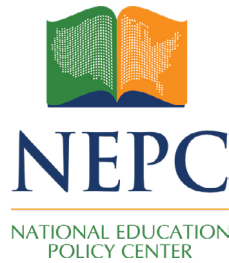
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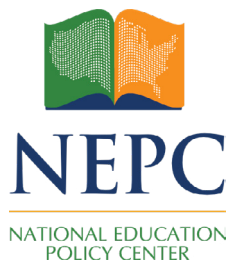
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Executive Summary

The cost and productivity of schools is hotly debated across the nation. Left-leaning groups argue for equitable funding and equality of opportunity. Right-leaning organizations contend that costs are too high and money is unwisely used. The Wisconsin Institute for Law and Liberty (WILL) joins this debate with *Money for Nothing*, which claims that Wisconsin does not get a good return on its educational investment. The report is based on three analyses: (a) of the ratio of non-teachers to teachers, (b) of per-pupil spending, and (c) of teacher pay. The report suggests there are too many non-teachers, per-pupil spending is not linked to higher outcomes, and teacher pay makes no difference in test scores. But critical errors in study design fundamentally negate these conclusions. The report flounders in arguing causality from correlation and misinterpreting statistical significance as representing meaningful policy effects. While “statistically significant” in many cases, the results are minuscule. This leads to false or unsupported conclusions clouded by the omission of critical details that prevent replication or confirmation. Rife with undocumented policy claims, the results run contrary to the literature on spending, administrator effects, and teacher effects. Unfortunately, no literature review is provided. The report fails to address the efficacy of interventions such as class size and early high-quality childhood education. The off-point theoretical base, flawed assumptions and meager findings shows the report earned its title, “money for nothing,” which could leave unsuspecting policymakers in dire straits.



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I. Introduction

A continuous budget conflict between pro-education and anti-tax advocates roils across the nation. In Wisconsin's case, over the objection of 100,000 protestors, the controversial Act 10 was passed. The law cut \$800 million (or 7%) from the education budget, resulting in a median teacher compensation loss of 8.2% with an 18.2% benefit cut. The law also placed extreme limits on collective bargaining, which sparked an exodus of experienced teachers who were replaced with junior teachers at lower pay.¹

It is in this environment that the Wisconsin Institute for Law and Liberty released its report, authored by Will Flanders, *Money for Nothing: The Relationship Between Various Types of School Spending and Academic Outcomes*.² The first paragraph of the paper squarely establishes the political context, noting that state Superintendent of Schools, Tony Evers, is a candidate for Governor opposing incumbent Scott Walker, who is seeking a third term. Claiming the mantle of a "pro-education governor," Walker points to increases in state aid during his tenure which raised the state dollar amount to a record high.³ Opponents counter-claim by saying that pay is low, the increase is still below inflation, and fails to consider higher education cuts.⁴

The cost indicators in the report under review are teacher pay and per-pupil spending. In an unusual analysis, the proportion of teaching to non-teaching positions is examined under the apparent assumption that non-teaching positions add costs without a return. Aggregating apples with oranges, the study's methods are questionable. Nevertheless, the underlying tension reflected in this report could apply to virtually every state, as the battle over providing and maintaining adequate educational funding continues—so the report and its analyses are worth examination.

II. Findings and Conclusions of the Report

There is not much meat in the new WILL report; it totals 16 pages, counting the covers and generous graphs, tables and white space. But it does make a bold primary assertion that non-teaching (including administrative) expenses are going up faster than classroom expenses which, nationally, is “having a negative effect on student outcomes.” Yet, in the same paragraph (p. 1) this central foundation is hedged with a note that “the effect of this spending pattern” in Wisconsin “is yet to be determined.”

Figure 1 of the analysis shows non-teaching positions fluctuating between 41% and 46% of staff over six years. Table 1 identifies, by name, the top 10 non-teacher salaries in the state. It does not portray the aggregate or the average salary by type of job. The purpose seems to be an effort to exaggerate non-teaching education salaries. This is followed by a district-level histogram of the percent of non-teachers (Figure 2), which shows that the vast majority of the state’s districts employ between 35% and 55% non-teachers. Interpreting the apparent discrepancy between Figure 1 and Table 2 is thwarted by the failure to label the vertical axis and the omission of basic descriptive data which would allow analyzing this distribution.⁵ Table 2 names the districts with the highest and lowest percentage of non-teaching staff but the relevance of showing only the extremes is not explained.

The study “conducted a statistical analysis with the share of non-teachers as the dependent variable.” In most education finance research, the dependent variable would be test scores or spending. The reader is provided inadequate explanations of the methods, data definitions, results, or benchmarks to make sense out of the numbers. Whether the proportion of non-teaching staff is necessary or not is not examined.

The four most important contrasts (Tables 3, 6, 7, and 8) are labeled as “correlates” but the procedures and data explanations are neither complete nor clear. The data presentation suggests multiple correlations with a number of commonly used and available demographic control variables (e.g., economically disadvantaged). The unit of analyses is said to be school districts (p. 6), of which there are 428 in Wisconsin. However, in Table 3 the number of observations is 2,527. The number of Wisconsin schools is 2,238,⁶ which suggests schools are the unit of analysis but, in the absence of clarity, the reader is left to speculate.

The difference in the number of observations is critical in this case. The larger the number, the easier it is to get statistical significance. Thus, an extremely low correlation can be statistically significant yet not be of any policy importance. For example, in Table 3, “Enroll” (which may represent district size, or enrollment, or number of schools, or schools plus districts) is statistically significant at the 0.01 level. But the coefficient is “1.43e-06,” in scientific notation this translates to -0.000000143. As the units of measurement are not provided, the methods are not explained, and all the variables are apparently on different scales, the meaning of these microscopic numbers cannot be determined.

In all four contrasts, the report consistently and incorrectly conflates “statistical significance” with causality and importance. This is a fundamental and misleading error. Statistical significance simply means that a variable can be discerned -- not whether it is particularly important. A better way to examine the strength of a relationship, for example, is to

look at the “R square.” This varies between zero (indicating no relationship) and one, with 1.0 indicating a perfect relationship of the measures. The highest R square in the report is 0.106 and the lowest is 0.09. These are quite low. In the important spending vs. proficiency contrast, the R square is not reported at all. The takeaway is that the reported “statistical significance” does not mean that the claimed relationship is important for policymaking. Perhaps the most important finding in the analyses, it goes unmentioned in the text.

The error is then compounded by treating these minuscule “correlates” as causation. For example, “The number of non-teachers” and “per pupil spending” has “negative effects on student performance.” This is a reach too far.

Moving along nonetheless, non-teachers’ job titles are presented in Tables 4 and 5. The largest category is “other,” representing 50% of positions. In trying to understand “other,” the report demurs, saying the data “does not allow us to drill down.” The author then “speculates” that the increase is in the “clerical and business office.” But without knowing what “other” means or true effect sizes, the policymaker is provided no actionable information.

The reader is also regularly challenged by poor editing, with a reference to Table 1 (on page 4) apparently meaning Table 3, and two references to Table 3 (on pages 6 and 7) apparently meaning Table 6. But looking at Table 6, we see the results of another fixed-effects regression. (The report states that the author also developed “a random effects model [which] is included in the appendix.” No appendix was attached to the report or found on the website.)

Toward the end, the paper gets to the central issue implied in the title, “Does Money Matter?” The author concludes that the higher the teacher pay, the lower the test scores. Over the time period 2011 to 2016, average Wisconsin teacher pay went from \$39,000 to \$42,500. The national average was \$59,660 for 2017-18, so the state’s teachers were relatively low-paid during the entire period examined.⁷ Additionally, a raise of \$3,500 over five years is not particularly impressive.

Even more problematic is the aggregation of three different state tests, presumably across all tested grades. The three state tests are different and the investigator says that a control variable for the difference in tests was part of the analyses, but none is reported. There is no mention of equating the tests or even standardizing the three assessment findings. Yet, causality is claimed: “Teacher pay has no relationship with student performance on state mandated exams.” This is a leap too far.

III. The Report’s Rationale for its Conclusions

In the introduction, the report states there is a negative relationship between student learning and the proportion of non-teaching staff. Other than a single self-published WILL paper about Act 10,⁸ no theoretical construct, rationale or supporting data is provided for this claim or for any other claim in the report. The approach seems to simply correlate commonly used and available variables with the proportion of non-teaching staff and mine the data looking for significant relationships. Given the eclectic collection of contrasts, there is no apparent rationale except inferred support for Act 10 and reduced spending.

IV. The Report's Use of the Research Literature

The report does not employ the research literature. Of the 13 endnotes, four provide explanatory comments, three are from internal WILL documents, and the remainder are from governmental data sources. None appear to be peer-reviewed.

In a paper titled *Money for Nothing*, the omission of the vast literature on whether and how money matters is striking. There are two major journals that focus on these issues, as well as two major professional associations that generate ample findings.⁹ During the 1990s an ongoing and high-profile debate occurred in the finance community as to whether and how money matters.¹⁰ Countless books, chapters, periodicals, seminars and the like have focused on this topic, yet go unrecognized and unexplored in the WILL report. Two recent major and well-known studies on the effects of spending on educational outcomes are not even mentioned.¹¹ If the interest was on "Money for Learning," the WILL report could have focused on lower class sizes,¹² detracking,¹³ and early education.¹⁴

In a Brookings report, Susannah Loeb notes that half the adults in a school are not teachers and poses the question, "so what?" There are valid reasons for non-teacher employees, and this may be the most cost-effective path in many cases. The differences in and across states vary by urban and suburban districts.¹⁵ In broad terms, it is indeed likely that non-teaching staff will not have much of an influence on test scores.¹⁶ The reason is simply that most non-teaching staff (such as bus drivers, clerical workers, custodians and the like), while essential for safety and school operations, have little learning interaction with children. Perhaps the primary reason the correlations are so low is because there is no reason they should be otherwise. But this is a very different question than whether Wisconsin is getting a good return on its educational investments.

V. Review of the Report's Methods

Several overlapping methodological issues are evident:

Theoretical Base

No rationale or body of literature is presented that examines the reasons for non-teaching staff or addresses the report's assumption that these staff members should have an effect on test scores. Non-teacher jobs run the gamut from bus drivers, custodians, and administrative assistants to relatively highly paid administrators, and half are listed as "others." It is not a natural or useful category for this sort of analysis.

Mystery Methods: Inappropriate, Inadequate and Unspecified Analyses

As noted earlier, the research questions are primarily tested by correlation and regression (pp. 4-5) using a small number of demographic characteristics as controls. Unfortunately,

the presentation consistently fails to precisely define these control measures. Further,

- Minuscule correlations are often declared causal effects without rational explanation.
- How the three different statewide tests were combined and equated is not addressed except to say they were used as a control – but how this was done is not reported in the data.
- The text discussing Table 6 says the unit of analysis is the district (p. 7), of which there are 428 in the state, but the number of “observations” is 2,500. Both districts and schools are apparently reported in the table but the reader does not know what was analyzed.
- Figure 2 does not label the vertical axis of the chart.

Statistical Significance is Not the Same as Importance

A primary shortcoming is the consistent confusion of a “statistically significant” finding with a meaningful policy finding. Statistically significant only means the measure is precise – not that it is large enough to be meaningful for policymaking. Since there are no simple correlation tables or definitions of measures, judging the accuracy of the claims is not possible.

Three solutions could have been employed: (1) providing the complete data, (2) looking to the R square rather than coefficients, or (3) standardizing the metrics. Looking at just the R squares that were provided suggests the relationships are likely too small to be useful for educational policymaking. For instance, percent of non-teaching staff is correlated with math and ELA scores (p. 7). Math has an R-square of 0.009 and ELA is 0.065. The math model accounts for less than 1% and the ELA is less than 7% of the variance. Again, the effects are so small and the construct is so weak that the findings are not useful for policymaking purposes.

Exaggerated and Misrepresented Conclusions

In the body of the report, the writing is somewhat careful. Correlations are presented properly (see p. 8). But on the front cover the correlations are exaggerated to, “The number of non-teachers on staff has a negative effect on student performance,” and “Per student spending has a negative effect on student performance.” Such sweeping claims are not supported by the data.

False or Unsupported Claims

Page 9 begins with, “Having established that spending more on administrators is not an effective strategy for improving proficiency, ...” The only support for this claim is found on page 1:

“...administrative costs are increasing faster than spending in the classroom,

and that this (sic) is having a negative effect on student outcomes. Previous research by WILL has shown that this has indeed been the case.”

The footnote directs the reader to the “previous research by WILL,”¹⁷ which did not analyze either administrative spending or student outcomes. Instead, that earlier report includes its own unsupported assertion:

“...it is clear that the additional resources school districts are devoting to spending outside of classroom activities are having a neutral to negative relationship to student performance.”

Again, no evidence is presented.

“In Wisconsin, school districts with higher pay have worse student outcomes than districts with lower pay (p. 10).” In this case, how teacher salaries and student proficiency are measured and the units of analyses are not explained. Some effort to explain this anomaly and the supporting research literature would have been welcome.

Lack of Transparency

The report’s description of the data is limited: “We combine data from *Open the Books* with data gathered directly from the Wisconsin Department of Public Instruction” (p. 1). With only this vague description, the report does not enable the basic scientific requirement of replicability. Moreover, a check of the federal staff counts indicates that the report’s data elements are not compatible with federal data or state submissions.¹⁸ The nation’s official reports, NCES and the CCD, were apparently not referenced.¹⁹

VI. Review of the Validity of the Findings and Conclusions

Given the overwhelming methodological shortcomings, the findings of *Money for Nothing* cannot be considered valid. The findings, without explanation or consideration, depart from the consensus of a vast literature, while incomplete and superficial analyses result in unsupported conclusions.

The report’s first research question, the ratio of teaching to non-teaching staff, is implied to be high and wasteful, but true needs are neither defined nor examined. Such staffing varies by district, geography, needs and the like but natural variation is not addressed. Likewise, listing the outliers does not address whether these non-teaching staff are essential. In fact, using non-teaching faculty for many tasks may be the most expedient and economical path.

The second research question, teacher salary and proficiency, is hampered by the use of three different tests and no equating or control data is provided. Perhaps more importantly, the low pay, small salary increases, reduction in benefits, and political turmoil surrounding teacher pay are neither examined nor controlled. Thus, the independent and dependent

variables are suspect and do not rule out alternative explanations.

The third research question, proficiency vs. per-pupil spending, is characterized by minuscule and unexplained results. Statistical significance is confused with effect size. The R square may have illuminated this issue but its singular absence from the table goes unexplained.

With the number of flaws throughout the manuscript, *Money for Nothing* provides no valid or trustworthy data.

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

This report lacks a theoretical or practical base and uses superficial and inaccurate methods. It could perhaps serve as a budget-making tool to alert local boards to scrutinize a particular non-teaching area. But this would require a finer-grained analysis.

Needs for non-licensed staff are not very elastic. For practical basic operations, a school needs a certain number of non-licensed staff for maintenance, food services, transportation, general support, and the like. Other non-teaching staff members are required to meet state and federal mandates. Special services for non-teachers are defined by needs and IEPs. Again, the data shows the vast majority of Wisconsin schools (or perhaps districts?) bunched up. This proportion may or may not be justified but that question is not addressed.

The fundamental problem is that the design of this research is weak and the findings so microscopically low that the paper is meaningless for policymaking purposes. Such research, however, comes at a cost. In this case, they have invested “money for nothing,” which put them and those who lend the report credence in dire straits.

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