

Using Data Analytics and Performance Management to Understand Differences in High- and Low-Performing Urban Schools

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Summary

This research brief summarizes a study that explored use of growth measures (i.e., value-added analytics) and achievement data in Milwaukee Public Schools (MPS), a large urban district in southeastern Wisconsin (Kraemer, Geraghty, Lindsey, and Raven, 2010). We were particularly interested in identifying and describing how value-added is used and understood at the school level because of the limited research on how value-added measures are used in schools to make decisions related to performance management (e.g., school improvement planning, professional development decisions, instructional practice choices).

Interviews with principals and observations of school improvement planning meetings were conducted to identify and describe (1) types of data and data use and (2) the human and organization factors in school-based performance management systems between high- and low-performing schools. Our findings suggest that:

- High performing schools that focus on growth of student learning, regardless of level of student achievement scores.
- Low performing schools view students' learning as fixed and determined by factors that the school can't control – such socioeconomic status, student mobility across schools, among others.

Introduction

This study aimed to identify and describe the human, organizational, and technological factors that may affect data use in a select yet diversified sub-set of MPS schools. We were particularly interested in how value-added is or is not used in schools and how perceptions of school performance (value-added relative to attainment) varies across school performance levels and types. We also were interested in investigating human and organizational factors from a performance management perspective, given that U.S. education (as well as other public sectors)

movement towards accountability-based reform (Stecher et al., 2010). Value-added is a central component to performance management reform in schools and districts, and is used for other accountability-based reform efforts, such as differentiated educator compensation (for example, see the Center for Educator Compensation Reform, 2010).

The full publication of this study can be found in Kraemer, Geraghty, Lindsey, and Raven (2010).

Study Background

The role of performance management in investigating “what works” to improve student achievement

An Institute for Educational Sciences (IES) panel on the use of student achievement data for instructional decision support conducted a systematic review of scientific literature and found that the existing research on using data to make instructional decisions does not yet provide conclusive of “what works” to improve student achievement (IES, 2009, pg. 6). The panel recommended a framework for using data to make instructional decisions. Some of these recommendations included human and organizational approaches; that is, using data and data analysis tools in conjunction with professional collaboration, the use of teams, and incorporating the user (i.e., student) in the analysis.

One pathway to address the concerns raised in the IES panel is the performance management movement. Performance management in the education context refers to the improvement of district (and individual school) effectiveness via a rigorous base of data that is used to regularly assess district and school performance and hold managers accountable (adapted from Heinrich, 2007). Performance management in education also embodies quality and systems management principles, methods, tools, and processes at every level of a school district (American Society for Quality, 2002).

However, there is a paucity of performance management research in U.S. K–12 education that reflects post-No Child Left Behind (NCLB) accountability standards and innovations in data

indicator systems like value-added. Further, the quality management approach in education does not fully integrate how human and organizational factors influence effective data use in performance management systems, such as teacher collaboration, the capacity to use data for instructional decision-making, and how educators view student performance in relationship to their own instructional practice.

Value-added measures and performance management in Milwaukee Public Schools

Value-added (VA) analysis measures school productivity and the contribution of schooling to growth in student achievement. It consists of statistical techniques that separate the impact of schooling from other non-school factors that may influence growth (Meyer & Christian, 2008). At the time of our study, the research study site, (MPS), used attainment scores on the state test to designate schools as high- or low-performing. However, attainment is not a productivity measure like VA; it does not filter out prior academic achievement, student mobility, or other factors like race and socioeconomic status.

MPS was interested to study the data use processes and how the district-mandated School Improvement Plans (SIPs) were used at the school level, across different school performance levels. The SIPs are part of an annual improvement planning process that schools engage in plan the following year's academic goals and strategies for improvement. One of the outputs of the SIP process is a completed SIP document that is submitted to MPS central offices for district office review and accountability confirmation.

Milwaukee Public Schools (MPS) is a large, urban district that serves 82,444 students in southeastern Wisconsin (MPS, 2010). MPS has been designated a "District Identified for Improvement" (DIFI). The DIFI status reflects the district's failure to meet reading and math attainment standards since 2004, as defined by NCLB. Given the urgency to improve district performance under the DIFI designation, we were particularly interested in high- and low-performing school comparisons.

Methods

The study consisted of an exploratory approach and used a field-based, qualitative design. The study consisted of cross-case analysis of eight schools. Semi-structured interviews with principals and non-participant observations of “learning team” meetings were conducted at each school. Learning teams are groups of school leaders and teachers tasked with, among other responsibilities, analyzing data and planning school improvement efforts.

Productivity at the school-level was defined using value added analysis and attainment scores on the state test to designate schools as high- or low-performing. However, attainment is not a productivity measure like value added; it does not filter out prior academic achievement, student mobility, or other factors like race and socioeconomic status. To address this difference in measurement type, we used a comparison of value added and attainment measures to select eight schools across four performance levels. The levels and their definitions are described in Table 1.

Table 1. Four performance levels of schools in MPS

| Performance levels | Definitions |
|--------------------------|--|
| High VA*/high attainment | High performing school. Students tested high on attainment, and their scores grew faster than the district average. |
| High VA/low attainment. | High performing school. Students tested very low on the state test and did not make the mandated proficiency goal, but their academic performance grew faster than the district average. |
| Low VA/high attainment | Low performing school. Students tested very high on state test, but grew more slowly in academic performance year to year, relative to the district average. |
| Low VA/low attainment | Low performing school. Students tested low on the state test, and also grew more slowly than the district average. |

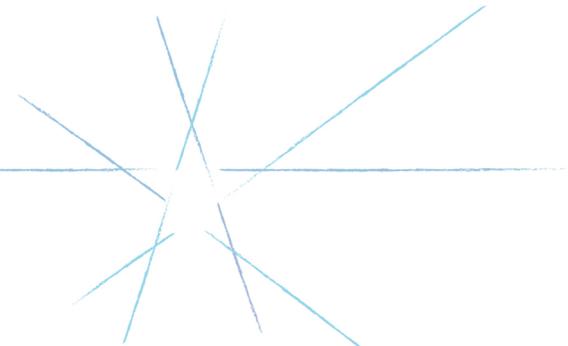
*VA=value added

Results

Findings consisted of two categories: (1) types of data and data use, and (2) human and organizational factors in performance management.

Comparative Analysis of Value-Added Perceptions

All schools used annual, state-administered test scores to assess performance and all but one low VA/low attainment used VA to assess their performance against attainment. See Table 2 for a summary of the views of schools across the 4 performance categories. The high VA/low attainment and the low VA/low attainment columns are shaded to signify that the schools in those categories are serving similar types of low-attaining students. The high VA/high attainment and low VA/high attainment columns are not shaded to signify that those schools are serving similar high-attaining students.



School reactions to value-added data varied:

- The high VA/high attainment schools viewed VA as a validation because it demonstrated that they grow high performing students (i.e., the high scores were not the result of a having “good” or “rich” students).
- The high VA/low attainment schools felt the same, in that VA was a validation of their ability to grow students even though their students’ growth does not meet district standards for attainment.
- Low VA/high attainment schools viewed their VA scores with some disbelief that they were not growing students and were not, in fact, a high-performing school (although they were interested in learning about growth strategies for high attaining students).
- Low VA/low attainment schools believed that students were the problem and did not acknowledge VA scores as a valid measure of student learning.

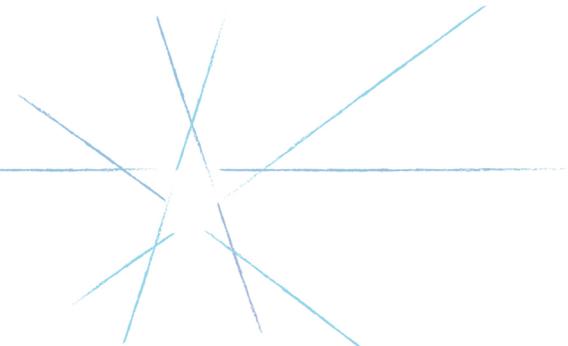
Table 2.

Summary of views of Value-Added metrics between high- and low-performing schools

| Characteristics of students | High-performing schools | Low-performing schools |
|---|---|--|
| ↑ socioeconomic status, ↓ student mobility, ↓ ELL | <i>High VA/high attainment schools</i> viewed VA as a validation to grow high-performing students, not just because they have rich kids. | <i>Low VA/high attainment schools</i> viewed VA with (some) disbelief (currently rated as high performing, but not growing high attaining students). |
| ↓ socioeconomic status, ↑ student mobility, ↑ ELL | <i>High VA/low attainment schools</i> viewed VA as a validation because of their ability to grow low attaining students (underserved students). | <i>Low VA/low attainment schools</i> suggested students were the “problem”. |

Data Use in MPS

All schools in this study used annual, state administered test scores to assess performance, and all but one low VA/low attainment school used VA to assess their performance against attainment. Schools used data for formative assessments in different ways. Schools across all four categories used short-cycle student assessment data for formative feedback on teaching and instruction, with the exception of one low VA/low attainment school. High-performing schools used summative data (e.g., VA, state test, program evaluations) to meet their strategic goals and more granular, short-cycle data sources to meet their short-term curriculum goals.



However, high VA/high attainment schools did not emphasize classroom observation data as key data sources, whereas high VA/low attainment schools reported using classroom observations as important measures of classroom instruction.

Schools also varied in the sophistication of their data use. The high VA/high attainment schools used gap analysis to identify mismatches between content areas of the state administered test and current curriculum. One of these schools also used horizontal alignment strategies to ensure consistency in curriculum across grades and vertical alignment strategies to ensure that curriculum necessary for progression in subsequent grades were taught in previous grades.

Human and Organizational Factors in Data Use and Performance Management

Performance management was largely dependent on the quality of its implementation. In turn, the quality of the implementation depends largely on the skills and attitudes of the people involved in the process, and of the tools available to them.

The tools in this study were the SIP and the available data. The schools cited some mismatch between the design of the SIP and how they manage school performance. The SIP was designed and formatted to comply with reporting requirements for district accountability purposes and as such, the plan was long and cumbersome to fill out. Many schools created a shorter version of the SIP that was customized for their schools. These SIP “briefs” were used to guide meetings and monitor progress on improvement initiatives and were more accessible to teachers.

High- and low-performing school personnel showed some key differences in their approach to data use for performance management. For example:

- High-performing schools articulated a “culture of data use and mindset of student growth” while low-performing schools focused on behavior rather than academic performance.

- High-performing schools emphasized learning team collaboration and representation of various school leaders and teachers. These teams met on a regular basis to discuss and plan for specific goals.
- Low VA/low attainment schools did not demonstrate this level of focus or team cohesion: Their meeting did not include an agenda, discussion of data or improvement planning, or plans for ongoing meetings and work. In one learning team session in a high VA/low attainment school, the team struggled to interpret short-term reading assessment data and formulate a coherent strategy.

Conclusions

The findings of this study suggested that school leaders' and teachers' perceptions of their productivity shape how they plan (or not plan) for performance management within their school.

Value-added analysis was one approach to differentiate and define performance because it provided counterpoints to low-performing schools and redefines "good" performance. High VA/high attainment schools serve as an example that it is possible to grow high attaining students every year. Conversely, high VA/low attaining schools serve as an example that all students can learn regardless of their starting point.

Some of the human and organizational factors in the school performance management system highlighted some mismatches between tools and technologies and how the work of school-based performance management is carried out by school staff. For example, the school improvement plan and data plans provided by the district did not reflect the flexibility and brevity needed for schools in their weekly performance planning. There were also variances in learning team performance, design, and interaction across the performance categories, which may reflect the misfit between teacher job characteristics and team-based collaboration for school improvement (Somech & Drach-Zahavy, 2007).

A human and organizational factors approach can assist the evolution of the use of value-added in performance management at the school level in two key ways.

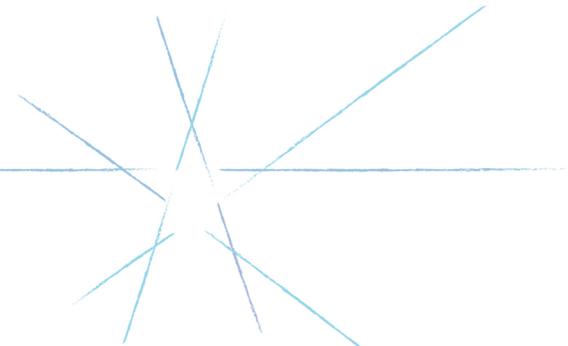
- A human and organizational factors approach to performance management in schools could enhance the effective communication and use of productivity metrics, such as value-added. Further, the comparison of value-added and attainment measures of performance could assist in the accurate recognition of school performance. This could include cross-school comparisons and networks of schools with similar student characteristics but which differ on productivity scores. The VA/attainment comparison metrics could be one way to differentiate school performance and provide differentiated support to schools based on their performance needs.
- Team-based organizational models need to be adapted and developed for the learning team approach to performance management, and those models need to account for the realities and constraints of teachers' workload, task/teaching composition, and training developments. Developing organizational and job design methods for teachers and school leaders could also be one way to reconcile the mismatches between teacher job design and collaborative, team-based approaches for school improvement.

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