



# Systematic Use of Data in Schools: Evidence from the National Center on Scaling up Effective Schools

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**Conference Paper**

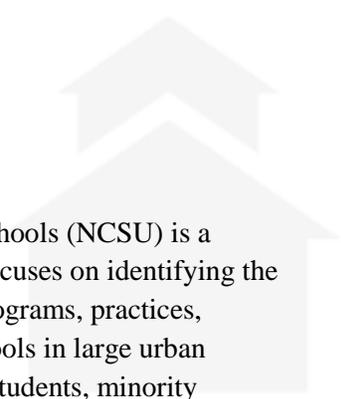
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THE UNIVERSITY  
of NORTH CAROLINA  
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The National Center on Scaling Up Effective Schools (NCSU) is a national research and development center that focuses on identifying the combination of essential components and the programs, practices, processes and policies that make some high schools in large urban districts particularly effective with low income students, minority students, and English language learners. The Center's goal is to develop, implement, and test new processes that other districts will be able to use to scale up effective practices within the context of their own goals and unique circumstances. Led by Vanderbilt University's Peabody College, our partners include The University of North Carolina at Chapel Hill, Florida State University, the University of Wisconsin-Madison, Georgia State University, and the Education Development Center.

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## Systematic Use of Data in Schools: Evidence from the National Center on Scaling up Effective Schools

Federal and state policies that bind schools within rigorous accountability frameworks and reward them for improving test scores present school actors with significant incentives for tracking and using student performance data. In this environment, school administrators are using data to make important decisions; examples include using performance data to reallocate staff, time, curricula, and even diet in an attempt to improve student achievement (Cohen-Vogel, 2011). Despite the growing prevalence of data use in educational organizations, however, relatively little is known about whether and how the process of integrating data into practice differs between more and less effective schools.

Through comparative case study, this paper seeks to understand the ways in which actors in high schools use and construct understandings about performance data as they make decisions in increasingly complex school contexts. The data for this paper are drawn from a larger study of high school effectiveness by the National Center for Scaling up Effective Schools; this larger study focused on eight components of school effectiveness ranging from quality instruction to personalized learning connections (Goldring, Porter, Murphy, Elliott, & Cravens, 2009).

Here, we focus on findings related to one such component – data use in schools. In particular, we ask: What kinds of data are available to the actors in our case study schools and how do they access these data? In what ways do actors in these schools use data, and how do they work to build the capacity of their staffs to leverage data for instructional improvement? To what extent do schools build “cultures” of data use, and how do these cultures manifest and condition the use of data in school contexts? Finally, based on our findings, are there systematic differences in the ways in which actors in “higher performing” and “lower performing” schools access, use, and understand performance data?

To answer these questions, we first synthesize the existing research on data use in schools in order to construct a comprehensive framework for understanding the kinds of information that school actors integrate into their practice, the ways in which they use that information, and the cultures they build to support data-driven practice. We then discuss the data collection and analytic methods used and introduce the four case study schools in which data were collected before presenting our findings.

### Framing Data Use in Effective High Schools

Today’s educators operate in information-rich environments in which numerous performance data exist that may inform decision-making and improve efforts to bolster student achievement (Anderson, Leithwood & Strauss, 2010). In order to better understand the role of information in schooling, we construct a framework for systematic data use that emphasizes three key elements. First, educators in effective high schools have access to and use a wide variety of performance data; further, they are afforded easy access to such data through comprehensive information

management systems. Second, actors across organizational levels in effective schools use data for a diverse set of purposes; effective schools also develop the capacity of school actors to do so through focused professional development. Finally, the use of performance data in effective schools is increasingly mediated by strong, positive cultures of data use, in which educators work together to use available information for school improvement and collectively construct positive perceptions of the benefit and utility of data use in their practice. Each of these elements, when in place, supports the development of schools as effective and efficient “learning organizations.”

#### *Data Access & Availability*

Research supports the idea that a wide variety of performance data are available to school educators (Louis et al., 2010; Firestone & Gonzalez, 2007; Guskey, 2007; Halverson, Grigg, Prichett & Thomas, 2007; Ingram, Louis & Schroeder, 2004; Guskey 2003). Further, these data are derived from multiple sources. School actors may, for instance, have access to data from external sources, like state or district performance assessments. They may further have access to internal, and often more informal, sources like teachers’ grades or classroom observations. Individual stakeholders may not, however, value internal and external performance data equally. Some research (e.g., Guskey, 2007; Ingram, Louis & Schroeder, 2004; Guskey, 2003) indicates, for example, that teachers may be unwilling to trust in the validity of standardized assessments, constructing an environment in which “being dismissive of externally generated achievement data is a cultural trait that teachers learn and pass on to other teachers” (Ingram, Louis, & Schroeder, 2004, p. 1273). Other studies (e.g., Cohen-Vogel, 2011; Anderson, Leithwood & Strauss, 2010; Guskey, 2007) suggest that district and school administrators are more open to utilizing externally-derived data, primarily for evaluative and staffing purposes. Louis et al. (2010), interviewing principals across a number of school contexts, found that the majority reported relying on “state-mandated” and “district-mandated” measures of student achievement to inform a number of decisions – including decisions regarding professional development or instructional improvement.

In terms of data access, the literature also indicates that school actors are accessing these diverse performance data through the use of increasingly complex information management systems (Louis et al., 2010; Gallagher, Means, & Padilla, 2008; Cohen, 2003). By and large, however, these systems are not uniform in their comprehensiveness, and may be limited in terms of the types of data they offer to practitioners (Means, Padilla, Debarger & Bakia, 2009; Gallagher, Means & Padilla, 2008). Cohen (2003) reports that recent efforts to expand access to state-level educational data are encouraging, and cites the Education Data Warehouse (EDW) movement as a prime example of how easy access to data may motivate educators to make wider use of available information. Petrides and Guiney (2002) support this, noting that the development of such one-stop-shops for data have ameliorated the issues caused by less efficient data systems, in which “departments and offices in schools maintain independent sources of data with these sources rarely related to each other” leading to “data redundancy and inaccuracies in the data over time” (p. 7).

#### *The Capacity for Data Use & Action*

A number of authors assert that developing capacity for data use among school actors is vital in

establishing effective data-driven practice (e.g., Louis et al., 2010; Wohlstetter, Datnow & Park, 2008; Halverson, Grigg, Prichett & Thomas, 2007; Kerr, et. al., 2006; Murnane, Sharkey & Boudette, 2005). Gallagher, Means & Padilla (2008), for example, find that teachers who reported high levels of confidence in their ability to use data and greater school support for professional development focused on data use were significantly more likely to report using performance data to communicate with parents, track student performance, identify skill gaps, and control instructional pacing (p. 20). Louis et al. (2010) find that, in schools exhibiting greater propensity for data use, “principals and teachers reported increasing efforts to develop the capacity of teachers to engage collectively in data analysis for instructional decision making”; “lower” data use schools, conversely, reported a strong reliance on external “experts” (p. 192). Further research (Means, Padilla, Debarger & Bakia, 2009; Gallagher, Means & Padilla, 2008; Murnane, Sharkey & Boudette, 2005; Sharkey & Murnane, 2003) suggests, however, that even as districts seem to be gradually improving support structures for data-use, including professional development, many educators, particularly teachers in schools not meeting AYP, still feel unprepared and undertrained to use data to engage in activities like interpreting test scores, adjusting curriculum based on data, developing diagnostic assessments, and interrogating data in meaningful ways.

Studies also show that school actors translate their capacity to use data into meaningful and varied action (Cohen-Vogel, 2011; Gallagher, Means & Padilla, 2008; Agnostopoulos & Rutledge, 2007; Firestone & Gonzalez, 2007; Lyons & Algozzine, 2006). Firestone & Gonzalez (2007) construct a broad typology of data uses, asserting that within local organizations data serves to guide instructional actions, enlighten actors, and mobilize support for decisions. Examples of the first categorization, “guidance for action”, have recently been documented in the literature. Cohen-Vogel (2011), for instance, finds that school administrators in Florida report “using students’ scores on the state standardized exam...to make teacher staffing decisions”; she also reports that “professional development, too, is planned with student assessment data in hand” (p. 499). Gallagher, Means & Padilla (2008) find that teachers report using data to monitor student progress and communicate that progress to parents; they also find, however, that relatively fewer teachers report using data to identify skill gaps in students, change their curriculum, or modify their practices. Louis et al. (2010) support this, finding that the majority of principals and teachers in their study of school data use reported using data for “problem identification”, rather than “problem solving”.

Relatively few studies tie data-driven practices, like those identified here, to improved student achievement. Anderson, Leithwood & Strauss (2010) suggest, however, that current conceptions of data-based practice in schools may be construed too narrowly and that positive effects may be more likely as school actors begin to go “beyond the identification of problem areas to an investigation of the specific nature of and factors contributing to [problems]” (p. 321).

### *Cultures of Data Use*

Researchers on the vanguard of the field are pushing beyond simply discussing the development of systems and capacity for data-driven practice in schools, and are beginning to explore what we call *the culture of data use* in educational organizations (Wohlstetter, Datnow & Park, 2008; Firestone

& Gonzalez, 2007; Ingram, Louis & Schroeder, 2004; Sutherland, 2004). As schools evolve into “learning organizations,” administrators may cultivate a culture of data use in which teachers are trained to “see the value of data” and actors construct “explicit norms and expectations regarding data use” that “foster mutual accountability” (Wohlstetter, Datnow, & Park, 2008, p. 247, 255). As Sutherland (2004) aptly states, under such a positive culture of data use, making reflective and systematic decisions based on information becomes “the way we do things around here” and data changes from “something that is done *to* the school” to “something that is done *by* the school and *for* the school” (p. 289). Ultimately, such positive cultures of data use promote an atmosphere of “organizational learning,” in which emphasis is placed on “improved instruction, problem solving, and an investment in the long term that incorporates teachers’ and principals’ voices” (Firestone & Gonzalez, 2007, p. 152).

Researchers also describe positive cultures of data use as highly collaborative in nature (Wohlstetter, Datnow & Park, 2008; Sutherland, 2004; Sharkey & Murnane, 2003; Huffman & Kalnin, 2003; Petrides & Guiney, 2002). Petrides & Guiney (2002), for instance, assert that collaborative data cultures embrace “communities of practice” in which actors construct knowledge ecologies that “weave together the actions of building a vision, stating the school’s mission, and engaging in reflective practice and inquiry” (p. 1710). Wohlstetter, Datnow & Park (2008) find that in districts with positive cultures of data use, teachers “rely heavily on one another for support, new instructional strategies, and discussions about data”; they also assert that “structured time around data discussions was probably the most important scaffolding for continuous improvement” in their case study schools (p. 253).

Based on this framework, data gathered in several case study schools were analyzed to determine how performance data were used and understood in both “higher” and “lower” performing schools. More specifically, we sought to understand whether or not the schools participating in our study were operating in the kinds of diverse knowledge ecologies – populated with internally and externally-derived data – identified by existing research. We also sought to identify the ways in which actors in our case study schools, both “higher” and “lower” performing, utilized data in their practice and how their capacity to do so was developed. Finally, we sought to understand the ways in which participants in our case study schools worked together to build cultures of data use, and the ways in which those cultures mediated their use of data in improving student learning and performance.

## **Methods**

### *Case Study Schools*

Working in Florida, we began by using a simple value-added achievement model (VAM) to estimate the relative performance of all of the state’s high schools. The estimated fixed effect for each high school in the state was put in rank order and classified by deciles of value-added. These analyses identified only one Florida district with multiple high and low-performing schools serving traditionally underperforming students; we selected this district for our work. The selected district has been engaged in a high school reform effort for the past nine years; it has also achieved

national recognition for its efforts to improve chronically low-performing schools. Despite these successes, the district has repeatedly failed to meet overall reading proficiency goals, as well as reading and mathematics proficiency goals for African American, economically disadvantaged and ELL-eligible students.

**Table 1.** *Demographic Profile of Case Study Schools: 2010-2011*

School	Grade	Trend	Enrollment	% FRPL	% MIN	% ELL
Pine Coast High	B	Steady	2800-3000	30-40	50-60	5-10
Beacon Hills High	A	Steady	2200-2400	45-55	65-75	5-10
Bay Mountain High	C	Mixed	1800-2000	60-70	55-65	10-15
Cyprus Cove High	A	Mixed	2100-2300	45-55	55-65	5-10

*Note:* Shaded cells indicate schools identified as “higher performing” using our value-added model; non-shaded are “lower performing”. To ensure confidentiality, school names are pseudonyms, and demographic values have been converted to ranges. Demographic data were derived from the School Public Accountability Reports (SPAR) compiled by the Florida Department of Education. FRPL = Free and Reduced Price Lunch; MIN = Minority (African American, Hispanic, Asian & Other); ELL = English Language Learners.

Four high schools in the district – two higher performing and two lower performing – were selected for case study on the basis of findings from the VAM analysis. The first of our higher performing case study schools, Beacon Hills<sup>i</sup>, had approximately 2200-2400 students in 2010 (See Table 1). Between 45-55% of those students qualified for free or reduced price lunch. The student body was predominantly comprised of students of minority descent, who accounted for 65-75% of the school’s enrollment. Beacon Hill’s school grade has been an ‘A’ over the last several years; the school’s success in meeting AYP resulted in its assignment to a less stringent category in the state’s differentiated accountability system than other schools in the study. One element that does differentiate Beacon Hills from the other schools in the study is its system of admission – students matriculate to Beacon Hills through a “lottery” system. Like many large, urban districts, the sampled district offers a variety of choice options from magnets to charters to schools within schools. While there are no performance criteria on which applicants are evaluated at Beacon Hills and the school is required to maintain a demographic makeup consistent with the wider district, there is an element of “choice” to Beacon Hills’s admissions process not present at the other sampled schools.

The second of our higher performing schools, Pine Coast, served between 2800-3000 students in 2010. Thirty to forty percent of those students qualified for free and reduced price lunch. Students of minority descent comprised 50-60% of the student body. Between five and ten percent of the school's students were classified as English Language Learners. Pine Coast's school grade has remained a "B" over the last three academic years and the school was in corrective status in 2010, as determined by the state of Florida's Differentiated Accountability (DA) system.

The two lower performing high schools in our study identified through value-added analysis were Cyprus Cove and Bay Mountain. Cyprus Cove enrolled approximately 2,100-2300 students. In 2010, approximately 45-55% of those students qualified for free or reduced price lunch; additionally, between 55-65% of the student body was identified as minorities. Five to ten percent of the school's students were classified as English Language Learners in 2010. Cyprus Cove's school grade, as defined by Florida's accountability framework, has vacillated between an "A" and a "B" over the last three academic years<sup>ii</sup>. During the 2010-2011 academic year, the school was classified as being in corrective status under the state's accountability system.

Finally, during the 2010-2011 school year, the second of our lower performing schools, Bay Mountain, had approximately 1800-2000 students. Sixty to seventy percent of those students qualified as free and reduced price lunch. Sixty to sixty-five percent of the student body at Bay Mountain was of minority descent. Between ten and fifteen percent of the school's students were classified as English Language Learners. Bay Mountain's school grade has shifted between a "D" and a "C" over the last several years, and it was placed in corrective status by the state's DA system in 2010.

### *Data*

Data analyzed in this study were collected from our four case study schools during three week-long visits in the 2010-2011 school year. In total, these data represent 120 participant interactions across the four schools, and provide a broad perspective of the perceptions and reported practices of actors, across organizational levels of each school, related to data analysis and decision-making. Specifically, we conducted 104 semi-structured interviews and 8 focus groups with teachers or students (See Table 2). In each school, interviews were conducted with the principal, assistant principals, guidance counselors, support personnel (e.g. lead instructional coordinators and ELL coordinators), students, and department heads and teachers of Mathematics, Science and English Language Arts. With regard to data use, interview and focus group protocols were designed to elicit participants' perceptions regarding the roles that data play in their practice, and included items for teachers, for example, like "How do you use data in your classroom?"

Our work was iterative. Throughout the data collection process, we interrogated the data in order to identify emerging concepts and avenues for further inquiry. This work was facilitated through the use of Post Interaction Forms (PIFs), which prompted us to consider the ways in which participant's responses supported or refuted the essential components framework and to identify emerging concepts or issues with the data collection process. Further, on a twice-weekly basis during the fieldwork, school teams met to discuss their individual PIFs and prepare a school report

synthesizing their collective work. After each full field visit, school teams used the PIFs and school reports to compile reports of our preliminary findings which were then analyzed by the NCSU team as a whole. Products from this reflective process included revised interview or focus group protocols, suggestions for further data collection activities or participant groups, and revisions/additions to our conceptual framework.

**Table 2. Data Sources by School**

<b>Interaction</b>	<b>Pine Coast High</b>	<b>Beacon Hills High</b>	<b>Bay Mountain High</b>	<b>Cyprus Cove High</b>
Prin. Interviews	2	2	2	2
A.P. Interviews	4	4	5	4
G.C. Interviews	2	2	2	2
S.P. Interviews	2	2	2	2
D.H. Interviews	3	4	4	4
Teacher Interviews	9	9	9	9
Student Interviews	3	3	3	3
Teacher F.G.'s	2	2	2	2
Student F.G.'s	2	2	2	2
<b>Total Interactions</b>	<b>29</b>	<b>30</b>	<b>31</b>	<b>30</b>

### *Analysis*

Following this iterative process of data collection and preliminary analysis, we began systematically analyzing data through directed content analysis (Patton, 2002). We started by analyzing the data categorically, first assigning basic, descriptive codes for *data access and availability*, *data capacity and use*, and/or *culture of data use among school actors*. Allowing themes to emerge from the data inductively (Miles and Huberman, 1994), we then cataloged the various data types as *internal* and *external*, *informal* and *formal* and the uses of data for *staffing decisions*, *instructional adaptation*, and *needs identification*, among others. Basic codes identifying *cultures of data use* were similarly expanded, to include secondary codes identifying participant responses describing *data use as a school-wide norm*, as well as *collaborative analysis and use*.

In addition to this descriptive coding, we also engaged in summative content analysis of participants' responses to interview and focus group protocols (Hseih & Shannon, 2005). As part of this analytic process, "rubrics" were constructed which researchers used to assign numeric scores for the intensity or frequency with which certain elements of systematic data use were reported by our participants. Coders worked collaboratively to identify these elements, basing their work on the same coding framework utilized in the directed content analysis process previously enumerated. The "rubric" elements evaluated by coders included: the *diversity of demonstrated use* (based upon the number of discrete uses for data identified by the respondent), the *frequency of demonstrated use*, *perceptions of the culture of data analysis and use* (rating the positivity or negativity of the respondents' expressed perception of the use of data in their school), and the *frequency of collaborative data analysis and use*. Mean scores across these rubric categories were computed and compared using independent samples T-tests to compare higher- and lower-value added schools.

Two people coded the data to promote reliability in the coding process. During the initial phase of analysis, the coding pair analyzed and scored the same transcripts, meeting frequently to collaboratively work through questions, refine our coding framework and rubrics, and to ensure that they were coding reliably with one another. Once reliability was established, individuals began coding transcripts and assigning rubric scores on an independent basis; throughout this second phase of the analysis, however, the coding team continued to meet to discuss potential issues in the coding process and emergent codes. Additionally, the coding pair completed four preliminary memos during the course of the coding process – two "annotated" memos, citing coded evidence and rubric scores to describe preliminary findings at each school in depth, and two "summary" memos, identifying similarities and differences across cases at each school.

### **Systematic Use of Data: Findings from Four Case Study Schools**

We report findings for the three components of our framework each in turn.

#### *Data Access & Availability*

Participants across all four case study schools reported that they are surrounded by various performance data from numerous sources. Several actors, for instance, indicated that they have access to externally derived data like AP scores, scores on the Florida Comprehensive Assessment Test (FCAT), and scores on district benchmark tests. A department head at Cyprus Cove, for example, highlighted the role of these data in her practice, sharing that "I think we are primarily driven by FCAT data for everything in the school. FCAT data, and of course... we have to look at pass rates [on the AP exam] for each course." Internally-derived information – like teachers' grades, attendance data, or informal dialogue with students – also reportedly plays a significant role in educators' work across all four institutions. Beacon Hills's principal, in particular, shared that he always finds time to talk with students to gauge the health of the school, asserting that

I tell people I can find out what's going on in the classroom just by walking around in the cafeteria... I will have a kid come up to me in the cafeteria and I say "Why aren't you in class?"

They will say, “Well, I want to talk to you about something.” I say, “What class are you in?” “Um, chemistry.” “Your teacher let you out? There is like 35 minutes left in the period!” “Yeah, she said I could leave...I was done.” That tells me that the teacher doesn't teach bell to bell.

An assistant principal at Pine Coast synthesized the varied types of information he utilizes in his practice, explaining that he “look[s] at the data for attendance. I am looking at the data for grades. I am looking at the data for achievement level, in the sense that every marking period I take a look to see the percentages, and do comparisons. Then I address those needs.”

Similarly, actors across all schools reported that comprehensive data systems are in place, allowing them free access to both internally- and externally-generated performance data. Common systems across schools are Virtual Counselor and Pinnacle. Virtual Counselor primarily serves school personnel, with Pinnacle largely serving students and parents. One teacher in Beacon Hills detailed the comprehensive nature of Virtual Counselor, sharing that the system

is more of a resource website where it shows the credits the student has taken, the track they are on, their grades in every class. You can look up FCAT data on Virtual Counselor. You can look at their schedule. You can look up every test they have had. It's like a counselor on computer. All of the records on that child for everything.

Typical of students' comments across the schools, one student shared that Pinnacle serves as a key tool in his/her parents' supportive efforts:

my Mom, she set-up this thing with Pinnacle that it like updates her every five minutes, and she always goes on. If the teacher puts in one early grade, like before we turn it in, [my Mom] will say, “Why didn't you hand it in?” I am like, “We didn't hand it in yet!” She stays on top of things to keep me on top of things.

Additionally, actors in Pine Coast reported that their access to both internally and externally-derived data is enhanced through a third comprehensive data system, developed within the school itself. The system incorporates scores on a series of formative assessments – derived from the district's benchmark tests – into the wider pool of data provided by other systems.

In general, school personnel across all four schools reported a balanced approach to choosing among available data in their decision-making processes. There were, however, some caveats consistent with prior research (Guskey, 2007; Ingram, Louis & Schroeder, 2004; Guskey, 2003). For example, compared to school leaders, some teachers in all four schools expressed a greater reliance on, and trust in, internally-generated performance data, like teacher-developed assessments, students' grades, or informal feedback from students. A teacher in Cyprus Cove summarized this perspective, asserting that, while externally derived data “helps to understand,” “that's not who those kids are. Those are living, breathing things. They are people. They have feelings and emotions”. This divide was reportedly much more pronounced in Bay Mountain, with a number of participants asserting that the perspectives of the faculty differed sharply from the administration, particularly the principal, regarding the relative emphasis that should be placed on differing types of data. One teacher in the school expressed frustration with the principal's focus on

externally-derived data, asserting that “all he talks about is numbers. The kids to him mean numbers. I guess for him all he wants is to keep his job and make sure...the percentiles, and make sure we meet AYP, so he looks good. I think that's all he wants, honestly”.

On the whole, we found few systematic differences regarding the ways actors in our four case study schools access data, or the nature of the data that is available to them. In both “higher” and “lower” performing schools, participants reported that they are immersed in information rich environments, and that the data available to them ranges from externally-derived data like standardized test scores to internally-derived data like informal student feedback. Actors reported that they access most of these data through the same information management systems. Finally, the relative value placed on various types of data was also fairly consistent across schools. While many teachers reported holding a greater trust in internally-derived data – especially in Bay Mountain, one of the lower performing schools – school actors as a whole seem to have adopted a balanced approach to selecting from available information.

### *The Capacity for Use and Action*

Participants in three of the four schools – Cyprus Cove, Beacon Hills, and Pine Coast –reported that there are systematic supports in place to build educators’ capacity to make use of performance data in their practice. Participants at Bay Mountain, on the other hand, reported that such efforts to develop the capacity of school actors to use data are highly infrequent and not systemic.

In Beacon Hills, efforts to build data-use capacity are enacted through “data chats” at the beginning of the year, in which an assistant principal, counselor, and teachers from across academic departments meet to collectively analyze data. A department head at the school described the activity as follows:

We were with the reading department, and, I believe, the foreign language department. We were all in one room with two guidance counselors and we went through our data. We had to fill out these sheets that basically told us which strands, or which benchmarks the kids were lowest in. What was your lowest, medium, and high, so that we could formulate a plan the very first day of school.

Participants in Cyprus Cove reported that they engage in a similar process. The school’s principal shared that

We have chats with the teachers during their planning periods, and everything is broken down into three's. We talk about three things every three weeks. [At] our most recent one, we talked about identifying your students that are in your lowest quartile when you look at the data. And, sub groups – identifying who are those kids, where are we at with them, and what's your approach in teaching them. And, looking through the lesson planning piece. Our next chat focuses on what are you doing with those kids, give me specific best practices that you are doing to share among the staff.

In Pine Coast, actors reported that capacity development centers on students’ performance and is a

responsibility of the recently formed instructional leadership team. According to one department head there,

All my teachers were urged to print-out their student data, every class. And, I wanted them to highlight every kid who is under the 30<sup>th</sup> percentile in reading and math, and look at it on a daily basis. So that has been a tremendous change. I can access that information in two seconds.

Another Pine Coast department head asserted, however, that professional development around data use in the school is “not formal and not ongoing. We have looked at the different data in reading and math across the board, and in FCAT scores, and in Algebra grades, different things, but not in a consistent manner and not ongoing throughout the year.”

Participants at Bay Mountain, by and large, did not report that there are systematic efforts to develop the capacity of the school staff to use data to inform their practice. One assistant principal indicated that he is trying to build on his teachers’ ability to use data, and that they “work a lot on data and being able to break down what’s going on.” He also indicated, however, that the opportunities available to do so are “not enough” and did not indicate that these efforts are school-wide.

Participants across all four case study schools reported that their use of data largely falls within the boundaries of providing “guidance for action,” as articulated in the Firestone & Gonzalez’s (2007) typology. Based on the data gathered in our case study schools, we extended this element of their framework and construct two “sub-categories” – using data to *guide the structure of the learning environment*, and using data to *inform the instruction of students*. All four schools, for example, reported that performance data play a key role in structuring the learning environment by informing decisions regarding student placement. This is largely enabled by a district-created “assignment matrix.” An assistant principal in Beacon Hills described the process this way:

Each student is assigned [to courses] based on their standardized test results, based on their performance. We believe it’s important to have an appropriate match of curriculum to the students’ ability. So students who have the ability to take Advanced Placement classes will be enrolled in Advanced Placement classes or Honors classes and so forth. If a student shows a deficiency, whether it be in math or reading or writing, then they will be enrolled in a class to help conquer that deficiency and increase their achievement. So all assignments are based on the student data.

Actors in three of the four schools – Cyprus Cove, Bay Mountain, and Beacon Hills – reported that data also guide the structure of the learning environment by informing the process of teacher assignment. An assistant principal in Cyprus Cove, for example, shared that the process of assigning teachers to courses revolves around questions like: “‘Based on the data, tell us do you think teacher X is okay to handle the Algebra classes next year?’ ‘Let’s look at his or her learning gains for the students, and see if maybe that’s a good fit, or maybe it’s not.’ Most of our teachers are placed into their classes accordingly.”

The principal of Bay Mountain offered a similar example:

For the last three years, I have looked at my writing teachers' scores on the FCAT, and I have some teachers that are just like consistently in the 70, 80 percent of 3.5s and 4s. Then over the last few years, I have had teachers that were not, were like 50's and 60's. So I made some like really conscious decisions, like I took a couple of people out of 10th grade writing, meaning the 10th grade English teachers, and I put some other people in. I had one person that only had one section, but she had great scores. So the next year she had all of 10th grade [a tested grade].

Participants across all four schools reported that data guide their efforts to instruct students, as well. Their efforts are expressed in two dominant forms: the targeting of certain students for intervention and the modification of classroom practice. By and large, participants were more likely to report that data are used to target groups of students for intervention or additional services than to report using them for instructional modification. A number of participants, particularly in Pine Coast, reported that they use data to identify students in the “bottom 30%” for “pull-out” courses or remediation. A department head in Beacon Hills offered another example of “targeting” students for intervention:

After spring break, we are going to have our “crunch time tutoring” for our level three students. Students that have just made FCAT level three. Our concern is that sometimes these kids fall back because they don't have a reading class, so those students – it's about 170 of them, 9th and 10th graders – they are going to get pulled from their elective class starting when we come back from spring break, and I will be tutoring them up to the test.

On the whole, participants reported that they use performance data to modify classroom instruction far less frequently than they use it to “target” or identify student groups. Participants in Beacon Hills reported one of the few cases of systemic instructional adaptation based on data. Members of the administration indicated that scores from the district’s benchmark assessments are used to tailor school-wide “do-now” activities aimed at specific deficiencies in student performance.

There was some evidence, particularly at Pine Coast, that actors are using data to reframe issues or challenges faced by the school, in accordance with the second element of Firestone & Gonzalez’s (2007) framework – the use of data for “enlightenment.” Specifically, the school leadership work to couple efforts to “target” students for academic services with a refocusing of the faculty’s attention onto the needs, both academic and affective, of lower-performing students. One department head in the school discussed this reorientation of the school’s collective focus:

We are all told we need to know who our lowest 30 percentile are so that we can identify them and establish a rapport with them, whether you [teach] Honors or not. Right now with the way things are, I have students in my Honors and even one in my Honors Gifted that is in the low 30th percentile. I have kids who are in Honors English *and* intensive reading... Build a rapport with them. Talk to them. Encourage them to pass this... Just help them focus, encourage them to do better for themselves. Not necessarily for us. Yeah, it will improve our score, but for themselves as well. Sometimes the kids don't know they are the low 30th percentile because they don't even know their FCAT score.

Finally, evidence gathered in Bay Mountain indicates that school leaders there are using data to “mobilize support” in accordance with the third element of Firestone & Gonzalez’s (2007) framework. The efforts of the school’s leadership to mobilize teachers toward higher performance, however, may represent an inversion of the authors’ concept, wherein underperforming teachers are “named and shamed.” At this school, students’ scores on the state assessment are distributed next to the names of the teachers who teach them. One teacher in the school described the process, saying

I have to meet with my administrators occasionally. They are asking me hard questions about the data: “What I am doing?” “How are things going?” My data is published at the end of the year. It’s made public. I mean that in a loose sense. Not to the whole community, but other teachers can see what kind of learning gains did [I] get last year.

Another teacher at the school reported that data

end up around the whole school. I am not in his department, I know what percentage he has, and I know his score. It was pointed out: “Should we do what we normally do and hide the names?” [The principal replied,] “No, leave it like that. I want everybody to see the names.” That was a decision that was made, and I can only think it was to embarrass people into doing better.

Overall, participants in our case study schools did not indicate that there are systematic differences in the way that higher and lower performing schools use data to guide and inform their practice. In all four of our case study schools, participants indicated that data play a variety of roles in their work, providing valuable information used to structure the learning environment and, to a lesser extent, instruct their students. Moreover, in both of our higher performing and one of our lower performing schools, actors reported that there are systematic efforts to build the capacity of the instructional staff to use data in their practice. One school did stand out, however. According to participants at Bay Mountain, there are few efforts to develop the faculty’s capacity for data use and a strong emphasis on accountability and “shaming” teachers with data.

Analysis of the rubric scores across all four schools support findings from the qualitative coding described throughout this section (see Table 3). In comparing mean rubric scores for participants’ use of data, we find no significant differences between higher and lower value added schools for either what participants use data for (*diversity of use* in the Table) or how often they use them (*frequency of use*).

**Table 3: Mean Scores on Rubric Dimensions by School**

Dimension	Cyprus Cove	Bay Mountain	Beacon Hills	Pine Coast	HVA/LVA Difference?
<b>Capacity &amp; Use</b>					
Frequency of Use	2.19	2.10	2.23	2.44	N
Diversity of Use	2.11	2.10	2.14	1.96	N
<b>Culture of Data Use</b>					
Perception	2.05	1.48	2.42	2.09	Y
Frequency of Collaboration	2.18	1.85	1.67	2.13	N

*Note:* Shaded cells indicate schools identified as “higher value-added” using our value-added model. The *HVA/LVA Difference?* column indicates whether mean differences between higher value-added schools and lower value-added schools are significant at the  $p \leq .05$  level.

### *Cultures of Data Use*

The extent to which our case study schools developed strong and positive cultures of data use varied across schools. Actors in Beacon Hills reported the “strongest” culture, indicating that they tended to view data as a beneficial part of their practice. One teacher in the school, for example, enthusiastically reported that “it’s everything. Data drives everything... That’s the base for everything I do.” Another participant expressed a more measured perspective on the use of test score data in the school: “I think it’s part of a component. I also think it’s observation. Checking the grades. Talking to the students. Talking to the fellow teachers. Talking to the department chair. This is a method to use to understand what’s going on in the room.” That same participant said she trusted the administration to make use of a variety of data in their decision making.

Participants in Cyprus Cove and Pine Coast expressed more mixed perceptions of the benefit and utility of data use, and indicated that data cultures were still growing and evolving in their organizations. Several teachers in Cyprus Cove, for example, reported that they were required to use data, and generally viewed it as necessary; some also indicated, however, that they did not hold a positive perception of how data was being used in the school:

We have to look at the kids who are low performing. How do we take this particular group of kids, and how do we move them to the next level? What do we do with it? I don't think we use data effectively. I think for the most part we collect it. We look at it. We talk about it and that's it.

Actors in Pine Coast High reported similarly mixed perceptions of data use in the school. One teacher, for instance, said:

I am going to be frank here. The jumping through hoops to meet certain requirements of testing, and meetings about your lowest quartile and your AYP – I mean, sometimes I feel like if they would leave us alone and let us teach we would be okay. So much of this stuff seems to be jump through hoops, and cover your butt... There is too much CYA here. That's all it is.

Another was more positive, however, asserting that: “when I see my kids, I could tell you off the top of my head they are weak in... Informational Text. So, I think that has been a tremendous positive change. Knowing where your students are. Where their weaknesses are, where their strengths are”.

Bay Mountain's culture of data use stood in sharp contrast to our other three case study schools. Many actors in the school expressed negative perspectives regarding the benefit of data-driven practice. Several asserted that this negative culture was engendered by a heavy focus on accountability, often public, on the part of the school's administration. One teacher, for example, reported feeling anxious about the results of external performance measures, sharing that

When I got the figures, I was distressed. My immediate thought is “What did I screw up? What didn't I get done that needed to get done? What did I not cover?” regardless of the fact that I put a lot of energy into that particular class. So, for me, how do I know how I am performing? The scores tell me something, but I don't think that's the full story... When I get the scores still, it takes my breath away sometimes. Makes me feel very worried, anxiety about what's going on”.

Others were frustrated. They perceived that the accountability system was based on one-sided or invalid state assessment data. According to one teacher, for example, “They don't even look at the data. Not your data. The data that they collect... all this home grown data, they haven't looked at that”. Another teacher agreed:

Every week or so there is pre and post assessments, and then there is training and another round of testing. They want me to look at this data and plan my instruction around it and I can't. The data isn't valid. I know what my kids' issues are. I see it in the work they turn in. That's where my instruction needs to take place.

In all four sampled schools, participants reported that programs or practices were in place for encouraging *collaborative* data use. These largely centered on “data chats” between administrators and teachers. Small Learning Communities and Professional Learning Communities were also named as venues in which teachers used data collaboratively. The frequency with which actors engaged in collaborative data use, and the benefit they perceived in doing so, varied between schools, however. Actors in Cyprus Cove, for instance, reported that teachers and administrators

collaboratively engaged with data on a frequent basis – every three weeks. Some participants in the school, however, reported that they felt these activities were less than useful. One, for instance, said that

we have data chats, which can get a little frustrating... Sometimes you sit in a meeting for an hour. It gets around to your turn so you talk for five minutes about what you did in your class that day, or whatever, and in the mean time, to be quite honest, in your mind you are like, “I could have graded a whole stack of papers.”

Participants in Beacon Hills and Pine Coast reported that they engaged in collaborative data use on a more infrequent basis – a few time per year in Beacon Hills, for instance – but that these activities tended to be productive and focused on instructional practice. Reports at Bay Mountain, again, stood in relative contrast to the other schools. While “data chats” were cited as an avenue for collaboration around data, participants said they occurred infrequently and served to bolster an already negative climate. According to one department head in the school, for example,

the pressure being brought to bear is just becoming more and more immense. It's a constant effort to prove what you are doing in the classroom, which, again, unless they are actually in there, how do you know what I said was true or accurate? Like I can make up some awesome crap. How do they know that's what happened in my room? So then in my mind, that whole meeting was just like bogus.

Again, there do not appear to be consistent and systematic differences between our “higher” and “lower performing” schools. In three of the four schools, participants indicated that they operated in functional cultures of data use. While participants in Beacon Hills reported a more generally positive perception of the benefit and utility of data in their practice, actors in both Pine Coast and Cypress Grove seemed to merely accept data-driven practice as the new norm. Similarly, participants in all four case study schools indicated that there were structures in place that served to support the collaborative analysis and use of available performance data. Once again, however, Bay Mountain stood out from the other case study schools. Compared to the other three schools, participants there reported that the culture of data use in which they operated was significantly more negative, and that they often questioned the benefit, utility, and even validity of data-driven practice in their school.

Comparison of the mean rubric scores for participants’ perception of the benefit and utility of data use does indicate that there is a significant difference between the higher and lower value-added schools in our study (see Table 3). But, as Table 3 shows, and the responses reported above reflect, this appears to be driven by significantly lower scores in Bay Mountain; on participants’ perceptions of data use, the school scored lower than every other school in the sample. There was not, however, a significant difference between our other lower value-added school (Cyprus Cove) and the higher performing schools in our sample. On this dimension, the gap in rubric scores between instructional personnel and administrators was narrower in Beacon Hills and Pine Coast than it was in the two lower-performing schools, suggesting that teachers and administrators in the higher-performing schools share similar perceptions about data use utility and value.

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**Table 4:** Mean Differences between Teachers and School Administrators on Rubric Dimensions by School

Dimension	Bay Mountain	Cyprus Cove	Beacon Hills	Pine Coast
Diversity of Use	-.571	-.524	-.524	-.410
Frequency of Use	-.691	-.800	-.500	-.933
Perception of Use	-.846	-.731	-.136	-.200
Frequency of Collaborations	-.900	-.333	-.095	-.733

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## Discussion and Conclusion

Without exception, participants in all four schools reported that they had easy access to a comprehensive pool of performance data. They also reported using data in similar ways, ways that we grouped into two categories: to guide the structuring of the learning environment and to guide instruction. All four schools also employed some structure by which data were analyzed and used collaboratively through data chats, for example, although the nature of these collaborations appear to have differed somewhat between organizations.

There did not appear to be clear differences in the ways the three elements of our data use framework played out in the higher and lower performing schools. There were, however, differences that distinguished one lower performing school from the others. Three of the schools in our sample, including the two schools identified as “higher performing” and another identified as “lower performing,” seemed to embed their efforts to make data accessible and build capacity for its use into a broader culture of “organizational learning”, as described by Firestone and Gonzalez (2007). School leaders in these schools appeared to use positive data cultures to promote an atmosphere of learning emphasizing continuous improvement and a long term vision shared by teachers and principals. Our fourth case study school, Bay Mountain, identified through our value-added model as “lower performing”, seemed to be mired in a very different context of data use, however; school actors reported that they often found themselves laboring under the negative effects of an “audit” or “accountability-focused” data culture. Here, data was constructed as being

the province of the administration, used to monitor and “embarrass” faculty and hold them accountable. This resulted in a negative, almost caustic, environment, with participants expressing a lack of confidence in the performance data, the utility of data collaboration, and the ability of the principal to promote the school’s success.

The findings from our four case study schools extend our knowledge regarding the ways in which schools engage in data-driven practice and promote functional cultures of data use in a few ways. First, we expand on the work of Firestone & Gonzalez (2007) by describing the ways schools work to develop capacity for data use. In particular, we classify what appear to be the dominant uses of data by schools into two key types, specifying the ways in which educators leverage data to inform the structure of the school’s learning environment and influence instructional practice. We also expand upon previous studies of data cultures (e.g., Wohlstetter, Datnow & Park, 2008; Petrides & Guiney, 2002) by describing actors’ perceptions regarding the benefit of data-driven practices, as well as efforts by schools to foster collaborative data use among their faculties. Finally, we show that consideration of any one of the elements alone may not be sufficient to explain the differences between more or less successful schools; instead, the three elements of our framework interact and combine to shape schools into varying data-use environments – “organizations of learning”, on one hand, focused on the use of data to empower instruction, or “audit cultures”, on the other, focused on the use of data for evaluation and accountability.

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## Endnotes

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<sup>i</sup> Schools were given pseudonyms to protect confidentiality

<sup>ii</sup> The state's grading system incorporates various performance indicators, only a small portion of which measure value-added. As such, it is possible that our "lower performing" schools – as measured by value added to the achievement of three traditionally underperforming subpopulations – may receive higher or average grades by the state.