

Lessons for Establishing a Foundation for Data Use in DC Public Schools

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The Senior Urban Education Research Fellowship Series

Volume I:

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Fall 2010

The Council of the Great City Schools is the only national organization exclusively representing the needs of urban public schools. Founded in 1956 and incorporated in 1961, the Council is located in Washington, D.C., where it works to promote urban education through legislation, research, media relations, instruction, management, technology, and other special projects.



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OVERVIEW

THE SENIOR URBAN EDUCATION RESEARCH FELLOWSHIP PROGRAM

Large urban public school districts play a significant role in the American education system. In 2007-08, the largest 65 urban school systems in the country - comprising less than one half of one percent of the nearly seventeen thousand school districts that exist across the United States - educated about 14 percent of the nation's K-12 public school students, approximately one third of its African American students, a third of its English Language Learners, a quarter of its poor students, and a quarter of its Hispanic students. They also employed nearly 15 percent of the nation's teaching force. Clearly, any attempt to improve achievement and to reduce racial and economic achievement gaps across the United States must involve these school districts as a major focus of action.

These school districts face a number of serious, systematic challenges. However, solutions to these problems are not always obvious, and the existing research base is not always sufficient to address them. In order to better understand the problems in urban education and to develop more effective and sustainable solutions, urban districts need a regular program of rigorous scientific inquiry focusing on what works to improve academic outcomes in the urban context. Moreover, in order to produce such evidence and to move public education forward generally, the standards of evidence in education research must be raised in such a way as to bring questions regarding the effectiveness of educational interventions and strategies to the fore and to promote careful scrutiny and rigorous analysis of the causal inferences surrounding attempts to answer them.

It has been argued that, in order to move such an effort forward, a community of researchers, committed to a set of principles regarding evidentiary standards, must be developed and nurtured. We contend further that, in order to produce a base of scientific knowledge that is both rigorously derived and directly relevant to improving achievement in urban school districts, this community of inquiry must be expanded to include both scholars and practitioners in urban education.

Though a great deal of education research is produced every year, there is a genuine dearth of knowledge regarding how to address some of the fundamental challenges urban school districts face in educating children--working to close achievement gaps and striving to meet the challenges of No Child Left Behind. Moreover, while there is a history of "process-related" research around issues affecting urban schools, relatively few studies carefully identify key program components, document implementation efforts, and carefully examine the effects of well designed interventions in important programmatic areas on key student outcomes such as academic achievement. In sum, there is an absence of methodologically sound, policy relevant research to help guide practice by identifying the conditions, resources, and necessary steps for effectively mounting initiatives to raise student achievement.

In order to address this need, the Council of the Great City Schools, through a grant from the Institute of Education Sciences, established the Senior Urban Education Research Fellowship (SUERF) program.

The Senior Urban Education Research Fellowship was designed to facilitate partnerships between scholars and practitioners focused on producing research that is both rigorous in nature and relevant to the specific challenges facing large urban school districts. We believe such partnerships have the potential to produce better, more practically useful research in at least three ways. First, by deepening researchers' understanding of the contexts within which they are working, the program may help them maximize the impact of their work in the places where it is needed the most. Second, by helping senior staff in urban districts become better consumers of research, we hope to increase the extent to which the available evidence is used to inform policy and practice, and the extent to which urban districts continue to invest in research. Third, by executing well designed studies aimed at the key challenges identified by the districts themselves, we hope to produce reliable evidence and practical guidance that can help improve student achievement across all urban school districts nationally.

The primary goals for the Senior Urban Education Research Fellowship are to:

- promote high quality scientific inquiry into the questions and challenges facing urban school districts;
- facilitate and encourage collaboration, communication, and ongoing partnerships between senior researchers and leaders in urban school districts;
- demonstrate how collaboration between scholars and urban districts can generate reliable results and enrich both research and practice;
- produce a set of high quality studies that yield practical guidance for urban school districts;
- contribute to an ongoing discussion regarding research priorities in urban education; and
- promote the development of a “community of inquiry”, including researchers and practitioners alike, committed to both a set of norms and principles regarding standards of evidence and a set of priorities for relevant, applied research in urban education.

The following volume of the Senior Urban Education Research Fellowship Series documents the work of Dr. Becky Smerdon, working in conjunction with the DC Public Schools (DCPS). Both the research and reporting is the sole intellectual property of Dr. Smerdon, and reflects her personal experience and perspective as an education researcher working in collaboration with DCPS.

Dr. Smerdon encountered some of the greatest challenges to working with large urban school district data and staff-- a lack of thorough, reliable extant student data, staff turnover, and a number of high-profile reform initiatives each competing for resources and attention. These challenges are by no means unique to DCPS. Moreover, we feel Dr. Smerdon demonstrated one of the most important elements in collaborative education research: flexibility. As she points out in the next section, her implicit goal in creating an early warning indicator system was to support the district's improvement efforts. DCPS is currently on the right track in creating reliable, valid student datasets, and to becoming a “data-driven” district. Certainly Dr. Smerdon observed and documented promising practices in data use being pursued by individual schools. But, the district-wide data necessary for executing the project Dr. Smerdon originally designed were not available as we initially thought they would be. So having reached a methodological “dead end” with the development of an early warning indicator, she went about producing a detailed audit and report on current data collection and use that could assist the district in understanding their current data limitations, as well as a collection of practical lessons and policy recommendations for establishing a foundation for data use in schools.

With so many districts at precisely this same, preliminary stage of building a data culture within their schools and at the central office level, we feel this work is particularly timely. We hope you will find it interesting and relevant to your own work. Thank you.

Michael Casserly
Executive Director
Council of the Great City Schools

ABOUT THE SENIOR URBAN EDUCATION RESEARCH FELLOW



Becky Smerdon is Managing Director of Education Research and Policy at Quill Research Associates, LLC. She was previously a Principal Research Scientist, Vice President and Deputy Director of U.S. Education and Workforce Development at the Academy for Educational Development, where she was leading the development of a research and development agenda on disadvantaged youth and education reform with a particular focus on successful transition to college and work.

Prior to working for the Academy for Educational Development, Smerdon was a Senior Research Associate at the Urban Institute where she led a formative and summative evaluation of Baltimore's high school reform initiative, a study of the math/science pipeline in North Carolina's reforming high schools funded by the National Science Foundation, and a project developing indicators of high school reform implementation funded by the Bill & Melinda Gates Foundation. Before joining the Urban Institute, Smerdon was a Principal Research Scientist at the American Institutes of Research where she led the U.S. Department of Education's National High School Center. She is a nationally recognized expert in high school reform and has conducted a number of research studies, many of which have been presented at national conferences and published in academic journals such as, American Educational Research Journal, Sociology of Education, Teachers College Record, and Research in the Sociology of Education and Socialization.

ABOUT THE RESEARCH PARTNERSHIP

In 2008, we began a project designed to identify the roots of the dropout problem in DC Public Schools (DCPS) by identifying middle grades students' exhibiting behaviors associated with dropping out of high school. Because the drop out problem is most pronounced in ninth grade, we chose to focus on the years just prior to ninth grade—middle school—and the transition from middle to high school. Specifically, our plan was to use DC Public Schools' extant data to create indicators of high school readiness by (1) identifying successful and unsuccessful high school students and then (2) using their middle school records to identify the middle school-level academic characteristics that distinguish successful high school students from their less successful counterparts. We planned to derive an indicator from these middle school characteristics that would serve as an "early warning signal" to distinguish between DC middle school students who are and are not ready for high school and more pointedly, those who are at risk of dropping out of high school.

Our first step in this project was to conduct a thorough inventory of the DCPS data, provided by the Center for Education Policy Research at Harvard University. Supplemented with data from the Common Core Data (CCD) and the DC Public Charter Board, we examined student-level data from grades 6-9 between fall 2005 and spring 2008. We found that the dataset had little missing information. Furthermore, we were able to supplement much of the data that were missing with information from the CCD, Census, and other external sources. Other than a few variables, we found the dataset aligned well with data found in other datasets, including the CCD. However, we concluded that a few variables should be used with caution, if at all—the special education indicator, attendance, mobility, and withdrawal information. For example, the special education data in 2007-08 indicated that all students qualified for services.¹ While this may have been a result of an error in the way the data were pulled from the system rather than a representation of the completeness of the data in the system, it presented a serious obstacle to our analysis. Moreover, withdrawal data were missing a key indicator needed to calculate withdrawal rates in 2007-08.² Finally, attendance data—a major component in early warning indicators developed in other jurisdictions—indicated that there were no absences in 2006-07; absenteeism data in other years may be underestimated as they appear lower

than expected compared with other jurisdictions such as Baltimore City Public Schools and Prince Georges County. Equally troubling was that only 23 percent of the students in the dataset had three years of consecutive data,^{3,4} which is not an adequate representation of the students in the District. Thus, we concluded that the DC Public Schools' extant data are not, at this time, suitable for the early warning indicator we had proposed to develop.

We expect, however, that the data necessary for the project we designed will be available in the future; Chancellor Rhee, as well as DC's Office of the State Superintendent of Education, has been working to create reliable, valid, longitudinal datasets. And while our initial and explicit goal of this project was to use data to investigate the location, degree, and sources of the dropout problem in DC public schools using an early warning indicator system, our implicit goal has always been to support and enhance the current and future school improvement efforts of DCPS, including schools' use of data. To this end, we revised our project goals to examine some of the data problems we uncovered when we conducted our inventory. Specifically, we visited a sample of K-8 schools in the District to learn more about how they collect and report data, as well as how they use data to guide their own decision making.

DCPS Chancellor Michelle Rhee supported our efforts, signing a letter of commitment on behalf of the district to participate in the project. Over the past two years, we met with staff from DCPS' Office of Data and Accountability on numerous occasions to describe the purpose of the project, request data, share preliminary and final results, and seek guidance on findings and their meanings. Elizabeth Cohen (formerly of DCPS, now working at DC's Office of State Superintendent of Education) and Hella Bel Hadj Amor (DCPS) were especially generous with their time. On occasion, we also met with staff in other offices (e.g., Office of Chief Academic Officer) by invitation of Ms. Cohen and Ms. Bel Hadj Amor. All draft and final reports and briefs were shared with Ms. Cohen or Ms. Bel Hadj Amor prior to submission to the Council of Great City Schools. And although DCPS has been undertaking one of the most ambitious and controversial reform initiatives in the country, support for this project never wavered and staff never hesitated to make time to talk.

1 To correct the issue of special education status, students were coded based on prior year's data, if available. Other special education variables were also used: *Special Education Status* and *Special Education Type* to verify or correct the designation status. *Status* and *Type* were usually only utilized if a student qualified for services. So, if *Type* or *Status* was used, the student was coded as qualifying for special educational services, but if *Type* or *Status* were blank, the students were coded as not qualifying. If *Status* indicated that a student had exited the special education program, the student was coded as not qualifying. This correction yielded a percentage not considerably lower than previous years and one that was comparable to CCD.

2 Withdrawal rates were calculated in 2005-06 and 2006-07 using *Withdrawal Date* and *Reason for Withdrawal*. In 2007-08, there was no date for *Withdrawal Date* so if a reason was given, the student was counted as a withdrawal. This most likely yielded a conservative percentage of withdrawals.

3 Across the dataset 45 percent of students attending public schools had only one year of data. While 54 percent had at least two years, these data may or may not be consecutive.

4 Please note these percentages only include those students that attended public schools for more than one year and do not contain students that attended a public school one year, a charter the next and an alternative school the following year (or any other plausible combination). Public schools were the focus because of the completeness of their data in the dataset.

EXECUTIVE SUMMARY

With a grant from the Council of the Great City Schools' Senior Urban Education Research Fellowship Program, we began a project designed to identify the roots of the dropout problem in the District of Columbia by identifying middle grades students' exhibiting behaviors associated with dropping out of high school. Our plan was to use DC Public Schools' extant data to create indicators of high school readiness by (1) identifying successful and unsuccessful high school students and then (2) using their middle school records to identify the middle school-level academic characteristics that distinguish successful high school students from their less successful counterparts. We planned to derive an indicator from these middle school characteristics that would serve as an "early warning signal" to distinguish between DC middle school students who are and are not ready for high school and more pointedly, those who are at risk of dropping out of high school.

After meetings with DC's Office of Assessment and Accountability, we conducted a thorough inventory of the DC Public Schools data, provided by the Center for Education Policy Research at Harvard University. Supplemented with data from the Common Core Data (CCD) and the DC Public Charter Board, we examined student-level data from grades 6-9 between fall 2005 and spring 2008. We concluded that the DC Public Schools' extant data are not, at this time, suitable for the early warning indicator we had proposed to develop. For example, attendance data—a major component in early warning indicators developed in other jurisdictions—indicated that there were no absences in 2006-07; absenteeism data in other years may be underestimated as they appear lower than expected compared with other jurisdictions such as Baltimore City Public Schools and Prince Georges County. Equally troubling was that only 23 percent of the students in the dataset had three years of consecutive data,^{5,6} which we did not believe to be an adequate representation of the students in the District.

Through our communications with the district and a review of district strategies, we also concluded that the Chancellor and her staff have been working diligently to

create reliable, valid, longitudinal datasets. In an effort to support their work, we revised our project goals to examine some of the data problems we uncovered when we conducted our inventory. Specifically, we visited a sample of K-8 schools in the District in the spring of 2009 to learn more about how they collect and report data, as well as how they use data to guide their own decision making.

This report is a summary of our findings and is organized into three sections. The first section describes what we learned from a series of data audits conducted in a sample of DC Public Schools. The purpose of the audits was to identify data reported by the schools, as well as identify information collected at the school, by whom, how often, where it was stored, and barriers to data collection. This section also provides a summary of if and how data are used in schools and classrooms. Key findings include:

- **Significant challenges to data quality.**

During the study period, there was a lack of universal practice and oversight by the district in creating data comparable across DCPS schools and ensuring accurate information within the system. For example, there was no central control over student ID creation and no validations (automatic or hand-checked) to the system to guard against duplication.

- **Infrequent use of data.**

During the study period, student data was used infrequently by school staff. In those schools that did use data, the data often appeared to be used partially, ineffectively, and/or inappropriately. For example, while some schools were using formative assessment data to track students, others used it to drill on test items and teach ONLY what was tested. In addition, most schools were using these results to identify and focus on the students just below the threshold of passing. These unanticipated and inadvertent uses of data are clearly not effective in guiding good instruction for each and every student and are, in our opinion, the result of a lack of knowledge about how to use data in meaningful ways.

⁵ Across the dataset 45 percent of students attending public schools had only one year of data. While 54 percent had at least two years, these data may or may not be consecutive.

⁶ Please note these percentages only include those students that attended public schools for more than one year and do not contain students that attended a public school one year, a charter the next and an alternative school the following year (or any other plausible combination). Public schools were the focus because of the completeness of their data in the dataset.

In the second section of this report, we make recommendations for laying a foundation for future data collection and use in DC Public Schools.

Data collection recommendations include the following:⁷

- Establish common, standardized definitions and coding procedures across the school district for collected data;
- Establish a set of validation rules that are applied to submitted data prior to formally accepting the data;
- Perform statistical checks on data submitted by schools;
- Establish a system for investigating the accuracy of data flagged by the statistical checks;
- Create standards for the percent of departing students that schools must be able to locate;
- Conduct on-site data quality checks at a number of schools each quarter;
- Determine and provide supports needed for schools to ensure the collection and submission of accurate and complete information (staff, computers, training, etc);
- Impose consequences on schools that do a poor job of collecting and submitting accurate and complete information.

Data use recommendations include building a data-rich culture, a step that requires at least five components:

1. leadership support;
2. a collaborative data team;
3. a regular time to meet
4. a central location for data, and
5. alignment of resources.

Finally, in the appendix we provide descriptive, cross-sectional analyses of one measure that has been associated with school failure and for which we have good data—students who are overage for grade.

⁷ Adapted from the Data Quality Campaign's Survey Elements: <http://www.dataqualitycampaign.org/survey/elements>

METHODOLOGY & DATA LIMITATIONS

To learn more about data collection and use at the building level, we selected two types of schools for site visits: (1) those that we determined were relatively data savvy, and (2) those that struggled with data use.⁸ Four schools were invited to be part of this learning process and all four agreed to participate. With one exception, the schools were part of a new (P)K-8 organizational structure in DCPS, wherein elementary schools began adding middle school students around 2005-06. All schools were minority-majority schools and all but one school exhibited proficiency rates of less than 50 percent. In each school, we interviewed staff about how data are collected, who collects the data, and how data are used to inform practice. During the interviews, school staff shared lessons learned in establishing a “culture of data-use.”

During the spring of 2009, one site visitor interviewed all school staff for this project, ensuring continuity among sites. The school principals were interviewed and/or additional staff such as teachers, coaches, and attendance officers who could provide essential information concerning the use of data at the school. Interviews with principals employed protocols designed to capture information concerning the school's vision of data practice and how the culture of data use was created, the specific goals of the data practices and resources provided to bring those goals to fruition, efforts to build organizational capacity as well as barriers encountered in their data work with staff and, most importantly, with the district. Other staff interview protocols covered topics such as conception and realization of the school's vision for data use, supports attributed (and needed) for the use of data, probing questions about the details of frequency, type of and accountability of staff data use, and the ability of their data practice to serve the needs of all students well.

In addition to these schools, information gathered from interviews and site visits conducted at other schools across DC are also included in this report. These schools were part of a different study we conducted and these visits were not specifically designed to discuss data collection and usage, but rather the progress of creating a K-8 model. Since creating a data community is just one component of a well-functioning school, information from these visits is also incorporated within this write-up for the purpose of providing additional insights.

It is important to note some of the inherent data limitations of drawing system-wide conclusions about data use or interaction with the STARS system based on the small, somewhat homogenous nature of this sample. For example, high schools and middle schools may use STARS more frequently than elementary schools for schedule development and attendance tracking. In addition, we recognize that different school staff interacts with DC STARS in various ways depending on their role. For example, registrars interact in a different way than master schedulers or teachers or principals.

Finally, the information presented and the conclusions drawn are a reflection of data collected at a past point in time, rather than present day DCPS. This study should not be approached as a survey of current practices in the district, but as an account of the data practices and limitations the district faced in recent years that may yield some useful lessons for DCPS and other urban school systems moving forward.

⁸ Determined through our previous and ongoing work in DC middle schools.

AT A GLANCE: DATA COLLECTED BY THE SCHOOLS

ASSESSMENTS

DC CAS: The District of Columbia Comprehensive Assessment System (DC CAS) was introduced in 2006 as a replacement for the Stanford 9 assessment. DC CAS was modeled after the Massachusetts Comprehensive Assessment System (MCAS). DC was hoping to replicate Massachusetts' success: Massachusetts' is both renowned for its assessment system and respected for its students' educational achievement, as measured by the NAEP. Although MCAS is still the stated ideal, today's DC CAS looks more like the Stanford 10 assessment.

Students in grades K-8 take the math and reading portions of the DC CAS. A science portion is administered to students in grades 5 and 8 only. The DC CAS consists of multiple choice and constructed response questions (open-ended questions, to which students respond in writing) designed to test DC Learning Standards. Students are rated at one of four levels: below basic, basic, proficient and advanced. The reading portion tests three strands of standards: vocabulary, informational text, and literary text. The math portion tests 5 strands of standards: number sense and operations; patterns, relations, and algebra; geometry; measurement; and lastly, data analysis, statistics and probability. The test is given in April and is highly anticipated, as test results provide an indication of whether students are making progress toward mastery of state content standards. They do not, however, count toward grade level promotion/retention or graduation decisions.

DC BAS: The DC BAS tests are the interim assessment/benchmark portfolio in DC and are administered to students in grades 3-10 four times throughout the year. The first test of the year provides a baseline; the other three tests measure student growth on the same grade-level learning standards. DC BAS tests the same standards on each test (as opposed to only the standards taught between tests) allowing for a measure of growth overtime. The tests mirror the DC CAS in format and substance.

Reading Level Assessments: The schools used either DIBELS or Running Records to record student's reading mastery levels. The Dynamic Indicators of Basic Early Literacy Skills (DIBELS) and Running Records are vocabulary and reading tests that measure early literacy skills from grades K-6. They are designed to be a short (3-4 minutes) but thorough assessment of a student's vocabulary acquisition and reading fluency and comprehension. Students are asked to individually read a list of grade-appropriate vocabulary words and a

reading passage out loud as a teacher records students' errors, self-corrections, substitutions of words, and other information. Teachers using DIBELS use a palm pilot to record this information while teachers conducting Running Records record this information on paper. These assessments are used to keep track of students' reading progress and to monitor their reading levels.

Accelerated Math: Accelerated Math is a computer program used in grades 1-8 to help students learn and build upon math content, knowledge, and skills. It uses an ongoing assessment to determine where students need further practice and provides them with such.

OTHER DATA

Attendance: Attendance is recorded at each school, either by a teacher or office staff member. Middle schools are to report attendance rates each period as a district mandate, but do not do so as a universal practice. There is no universal policy regarding the tracking of tardiness, excused absences, and early dismissals. The default designation in the program is "present" and schools are incentivized to have high attendance rates - from funding to district accolades; attendance is almost always part of the School Improvement Plan by which the principals are held accountable.

Classroom Grades: PK-6th grade teachers keep a paper grade book and record report cards on carbon papered report cards. These hard copy-only reports are kept in students' cumulative files. In one school, teachers had electronic grade books. In all other schools an electronic grade book was not something the staff desired or felt they needed. In these schools, middle grade teachers keep grades in a paper grade book and enter mid- and end-of-quarter grades in STARS, where the progress reports and report cards are generated.

Behavior data: All schools visited keep track of behavior by filling out paper referral forms that were submitted to the principal. The forms vary but usually ask for name of student, grade, date, teacher, who the referral was initiated by, the discipline infraction and the resolution (detention, parent phone call, etc.). Completed forms are kept in the students' record, in a centrally located binder or a file cabinet or by the teachers, as set by the school policy. This information is not recorded electronically and when asked if recording it electronically would be helpful, some indicated they would (but had no plans of using the information); still other schools indicated a lack of resources to input the information electronically into STARS.

DATA BEING COLLECTED AND UTILIZED BY THE SCHOOLS

Most data collected within the schools appeared to be formative assessments, although school personnel collected attendance and behavior information as well. Schools received demographic information from the district as well as the students' previous year's assessment data (DC CAS scores).

Data are supplied to the district and received from the district through a Student Information System (SIS)/data warehouse software called Student Tracking and Reporting System (STARS).⁹ DCPS purchased STARS in the spring of 2004 and began a three-phased implementation for rolling out the software. Starting first with a pilot school, the district then provided the software to elementary and finally middle and high schools. With the new system, DCPS hoped "to change the paradigm for school accountability through the implementation of district-wide standards for curriculum and courses, enrollment practices, attendance, scheduling practices, graduation requirements, report cards, and transcripts."¹⁰ DCPS is still working to achieve this goal.

The only data that schools discussed viewing or downloading via STARS were student demographics. Schools uploaded attendance and middle school grades to the system, as well as recorded student withdrawal information. All other data collected at the schools were housed within other programs or hard copy only. We are uncertain if these other programs are compatible with STARS.

ASSESSMENTS

DC CAS: DC CAS results from the previous April test administration are delivered to schools in mid-fall of the following year. Several types of hard-copy reports are sent to the schools: individual student reports (Figure 1), class reports of proficiency, a report showing a breakdown of all students' performance on each test item, and proficiency rates disaggregated by demographics. The only information provided for an individual student is shown in Figure 1.

According to our study participants, staff members rarely engage with DC CAS data and for several reasons. First and foremost, these kinds of tests are not designed to be useful for schools in making adjustments to classroom instruction. For example the deepest level of disaggregation of the DC CAS test information is the strand (3 strands for reading and 5 for math; see Figure 1). Thus, teachers are unable to determine with which specific skills students are struggling, making it difficult to manipulate the data to answer specific questions on student performance or plan specific directions in which to teach because the data do not allow that level of detail. Charts indicating the average percentage of students proficient in math and reading over time are often hung on the wall, but largely forgotten during discussions or decision-making.

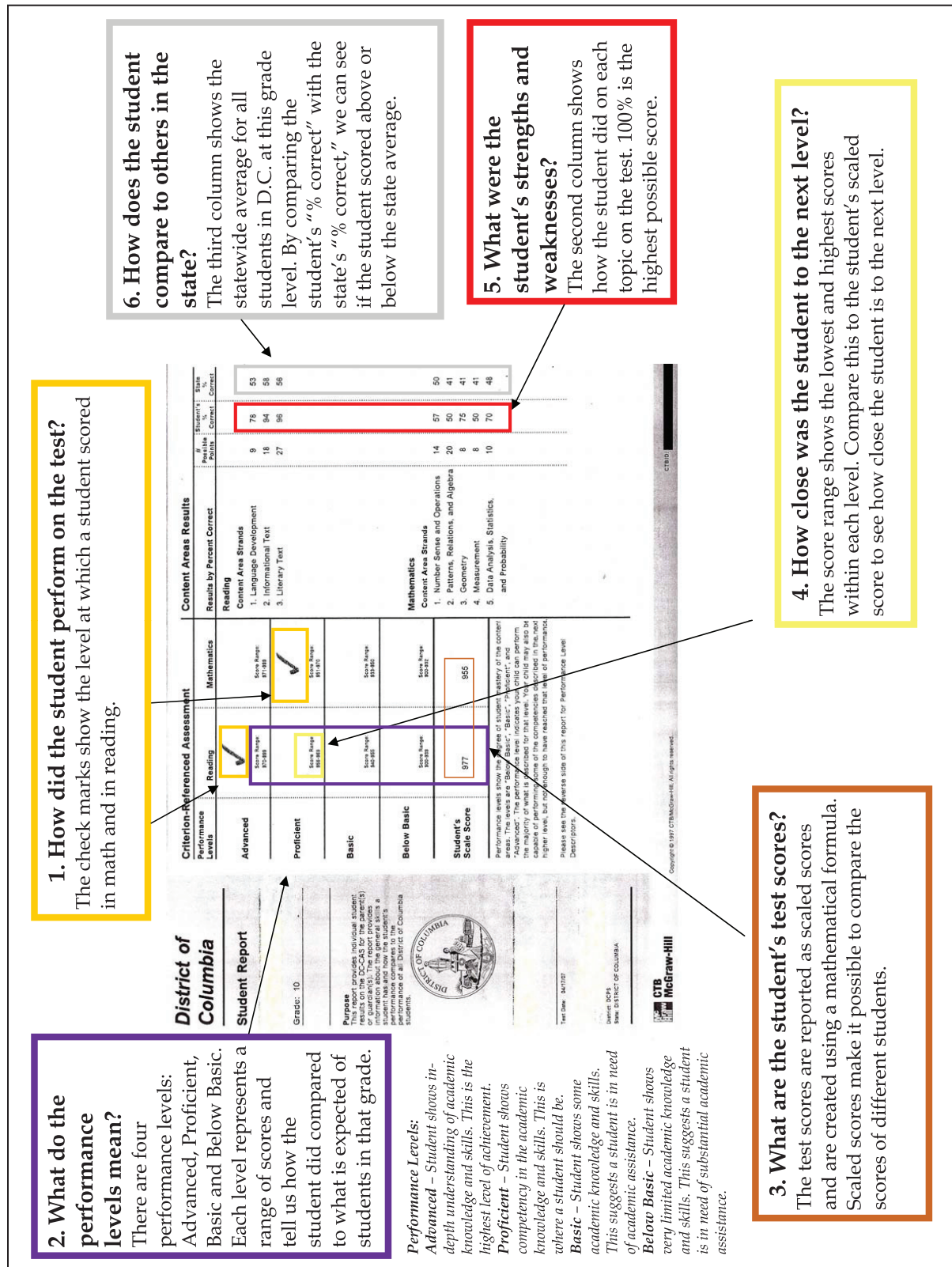
DCBAS: Schools depend on DC BAS scores as their main data source. The DCPS data are disaggregated by strand and learning standards and stored in a program called Discovery ED, which allows schools to compare themselves against the district average and other schools. Using Discovery ED, staff can also measure student growth in several ways: against average student growth in the district; against a set trajectory of "normal or expected growth;" within a class; and/or with a particular student. However, such growth is only in the aggregate; measuring growth or set-back on particular learning standards is difficult and requires information to be pieced together from one test to the next. Because interim assessments are only given every six weeks, mid-course corrections to topics of further teaching tend to only be done on this timeline.

Reading Level Assessments: If using DIBELS, student's errors, self corrections and other stumbles while reading a passage or list of vocabulary words are fed into a computer program, which issues a "grade:" red ("alarm;" in need of reading intervention); yellow ("basic;" in need of reading intervention); or green ("on grade level;" no need for intervention). The program recommends intervention

⁹ Information from this audit was further verified by District of Columbia Public schools and public charter schools enrollment census, October 5, 2007 by Thompson, Cobb, Bazilio & Associates, PC http://www.seo.dc.gov/seoframes.asp?doc=/seo/lib/seof/information/school_enrollment/2007-2008_Final_Audit_Report.pdf

¹⁰ Pg 2; District of Columbia Public Schools: Student Information System Implementation to Support Transformation in Accountability: http://www.03.ibm.com/industries/global/files/dcps_services_case_study_final.pdf?re=education&sa_message=title=district_of_columbia_public_schools

FIGURE 1: DC CAS STUDENT REPORT

Source: http://www.k12.dc.us/offices/oda/doc/DCCAS_Overview_Brochure_FINAL_March6.pdf

DATA BEING COLLECTED AND UTILIZED BY THE SCHOOLS

strategies for teachers to use with each student, based on his or her strengths and weaknesses, along with worksheets and lesson plans to target areas in need of improvement. Running Records requires teachers to analyze the data and based on the types of mistakes the student is making, set up intervention strategies. These assessments are time consuming because they are done one-on-one with the teacher and tend to only be done a few times a year, if not only at the beginning of the year.

Accelerated Math: At the beginning of the year, students take a diagnostic test called STAR (not to be confused with the SIS used at the district), which the teacher then reviews. Based on the students' performance, the teacher assigns the appropriate Accelerated Math lessons. The computer tracks students' progress in each lesson and responds to students' struggles.

OTHER DATA

Attendance data: According to the staff we interviewed, attendance data are rarely part of conversations about students or their achievement. Only one of the schools we visited posted attendance data and it was used as an outcome rather than an additional piece of input information. Reports are run from STARS weekly so schools can ensure attendance was taken every day. Schools with a staff member designated to work on attendance appear to have a well-run system of using the data effectively to identify students that have been absent for more than 3 to 5 days, notifying parents, having a conference and attempting to figure out how to get the child to school more regularly.

Classroom Grades: We did not find evidence that grades are used as a measure of progress or success in data analysis by the schools.

Behavior Data: As mentioned earlier, behavior data consists of paper referral records. These records are mainly used as backup documentation when meeting with a parent about unsatisfactory behavior or when justifying a suspension. These data are not used as a measure of progress or success in data analysis by the schools.

Demographic data: We also found no evidence that demographic data are used at the schools to examine patterns in the other data collected (e.g. test scores by race/ethnicity, gender, etc.).

Student withdrawals: As mentioned earlier, there are no guidelines for systematic collection of this information and we did not find that they are used as a measure of progress or success in data analysis by the schools.

DISCUSSION

As we have learned, having access to data is certainly not the same as using data, and using data is not synonymous with using it effectively to guide and refine instruction. Establishing the foundation to facilitate and support the use of data was needed, at least to some degree, in all of the schools that we visited. In cases where schools used data, such as the DC BAS, the data appeared to be used partially, ineffectively, and/or inappropriately. For example, some schools were using the DC BAS to track students, others to drill on test items and teach ONLY what was tested but most were using these results to identify and focus on the students just below the threshold of passing.

These unanticipated and inadvertent uses of these data are clearly not effective in guiding good instruction for each and every student and are, in our opinion, the result of a lack of knowledge about how to use data in meaningful ways. Based on our observations and understanding of the extant literature and data tools, we recommend that DCPS take a number of steps to build a data community to collect accurate data and use these data to further their goals of creating educational experiences that meet the needs and challenge the strengths of all students. We discuss these recommendations in further detail in the section that follows.

BUILDING A DATA COMMUNITY

A tool such as identifying students that are at risk of dropping out is only as effective as the data are valid, reliable, and used to inform policy and practice. The schools we visited were at varying stages of incorporating a strategy for data use, such as an early warning indicator. While approaches to data use differed across schools, the necessary precursors for successful use are fundamentally the same. As illustrated in Figure 2, this next section discusses the key precursors to developing an effective, data-driven decision making process and data-rich culture and how the intersection of federal, state, and district policy can and do effect the data collection and use in a school and classroom. We touch briefly on the important role of these entities in ensuring that schools have the opportunity to create the essential conditions to use data effectively. Drawing from the literature on data use, we also highlight examples from our site visits in this section. Specifically, we discuss the type of foundation a school needs to collect, analyze and use data to guide instruction, make decisions, and plan for and implement a comprehensive improvement process using data. Lastly, we draw attention to what the research says about the process of how schools should go about using data effectively, providing detail regarding where the schools we visited were in this process.

ENSURING DATA QUALITY

The first step in building an effective data community is to establish systematic procedures to collect reliable, valid information that informs practices. The district and state are critical to this step, often providing resources and developing quality assurance policies. While this report does not go into great detail about the roles of district, state and federal stakeholders, as outlined in Figure 2, we will briefly discuss the importance of their presence in establishing high quality data collection standards.

The Role of Federal, State, District Policy

There has been much focus at the state level around building state longitudinal databases, but little to no mention of how schools will use the information collected or how the information should be collected. Since most of the data that populate state longitudinal databases come from schools, establishing and implementing systematic collection procedures is key to having accurate and usable data. Thus, initiatives and recommendations at the state and national level must expand their designs to involve not just districts, but schools and most importantly, teachers (see Figure 2).

Using data to improve student outcomes requires accurate data collection procedures throughout the education pipeline, but equally important, it requires the collection and applications that reflect what principals and teachers need to help their students succeed.

Invalid or unreliable data provided by some schools and districts is an issue in some states and these inaccuracies will continue if quality assurance procedures are not developed, implemented, and tested.¹¹ A well-designed and well-implemented state data audit system will help identify such areas of inaccuracy.¹² According to self-reported data (to the Data Quality Campaign), DCPS and OSSE do not yet have a process for conducting data quality audits but there are plans to develop one.¹³ This is not surprising given the issues we highlight below.

Our interviews provided information that outlines how district and/or state policy (or lack thereof) in DCPS has sometimes hindered the use of data effectively in the district schools. For instance, there have been several critiques of the STARS program and DCPS' use of it. STARS is the SIS for the DC Public schools only. Charter schools in the district do not universally use or have access to the program. As such, duplication of students across DCPS and charters has been problematic

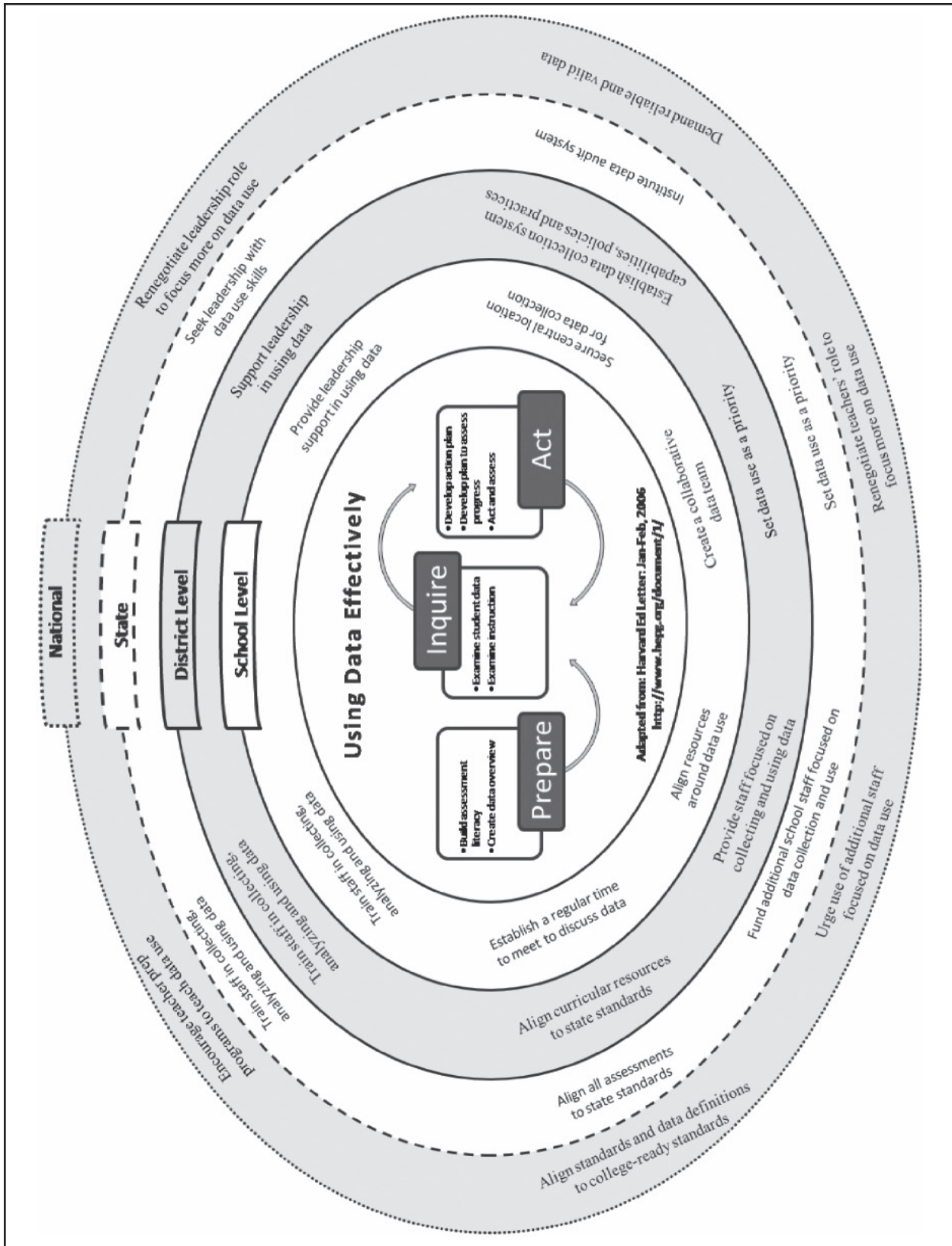
¹¹ Pinkus, L (2006). *Who's Counted? Who's Counting? Understanding High School Graduation Rates*. Alliance for Excellent Education. Washington, DC.

¹² Pinkus, L (2006).

¹³ Data Quality Campaign Survey Results, www.dataqualitycampaign.org/survey

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FIGURE 2: INTERSECTION OF NATIONAL, STATE, DISTRICT, AND SCHOOL IN CREATING A SYSTEM OF EFFECTIVE DATA USE



because there is no way to verify if a student is enrolled in DCPS as well as a charter school. As students move from charter to DCPS, or vice versa, student identification numbers may also duplicate because there is a lack of central control of the assignment of student identification numbers—school personnel are using and are authorized to assign different ID numbers.

According to the administrators and teachers we interviewed, the system does not require anything more than a last name to match a student to an already assigned student ID number. This is problematic because if there is a slight change in the spelling of the name (either via human error or just a previous or current incorrect record) or a name change, the student will be assigned a new ID number. A school can also assign an identification number to the student that was provided by the parent (and could be incorrect). There are no current validations (automated or hand-checked) to the system to ensure duplication of IDs does not occur.¹⁴

This need of central control over student identification numbers may have greatly contributed to our lack of longitudinal data. We may have had a much higher percentage of students in the dataset over time, but students may have had different identification numbers over time.

One common approach to addressing such issues is using birth date to identify duplications. This is not effective with the DCPS data, which lacks validation for dates of birth. The administrative records received from DCPS (via Harvard University) indicated several erroneous and obviously incorrect dates of birth for the grade level—students much too young or old for the grade level or the same student with multiple dates of birth. There are no current acceptable ranges for dates of birth in the DCPS

data system and thus no flags are raised when obviously erroneous birth dates are entered. This is particularly problematic for developing an early warning indicator, because overage status is an important component of academic risk.¹⁵

A lack of universal practices and processes laid out by the district and/or state also pose a challenge to creating data comparable across DCPS schools and ensuring accurate information within the system. For example, there is no standard way that schools record attendance. Some collect attendance records from teachers every day, some every week. Some middle grade teachers take attendance every period, others do not. Some teachers use A for absent and T for tardy, EA for excused absence, and UA for unexcused, while other teachers use check marks, hashes, slashes, and so forth.

There is also a lack of understanding over what is the “official record”; the STARS report, the manually kept record by teachers or the attendance card that the court system recognizes. Because students are defined, by default, as “present,” unless marked absent, failure to input absences results in misleading information and favorable average daily attendance rates that the schools are not likely to correct.

Another example of the need for universal practice is recording withdrawal rates. Withdrawal dates are not captured as the students’ last day at the school (but rather as the day the withdrawal is actually entered, the day the parent tells the school the student has withdrawn, the day another school lets them know that they have enrolled in their school, or any other date in between) and as such, a student will appear to be present after having withdrawn.

¹⁴ According to DCPS, DC STARS checks the following fields for potential existing matches before a new student ID is generated: Last Name, First three characters of first name, date of birth, and gender. A listing of existing potential student matches is generated in the system based on these criteria and users receive a warning message to review the list to avoid multiple IDs being created. Since 2007, principals have also received weekly data corrections reports that outline students that could potentially have multiple IDs. The administrators, teachers, and counselors interviewed, however, did not seem to have complete knowledge of this process at that time.

¹⁵ With little missing data on birth date and additional data points, we were able to construct an overage measure with confidence and examine it as part of this project.

BUILDING A DATA COMMUNITY

Recommendations to ensure that valid, reliable information is being collected include the following:¹⁶

- Establish common, standardized definitions and coding procedures across the school district for collected data;
- Establish a set of validation rules that are applied to submitted data prior to formally accepting the data;
- Perform statistical checks on data submitted by schools;
- Establish a system for investigating the accuracy of data flagged by the statistical checks;
- Create standards for the percent of departing students that schools must be able to locate;
- Conduct on-site data quality checks at a number of schools each quarter;
- Determine and provide supports needed for schools to ensure the collection and submission of accurate and complete information (staff, computers, training, etc);
- Impose consequences on schools that do a poor job of collecting and submitting accurate and complete information.

¹⁶ Adapted from the Data Quality Campaign's Survey Elements: <http://www.dataqualitycampaign.org/survey/elements>

ESTABLISHING THE FOUNDATION OF A DATA COMMUNITY

Based on our understanding of the literature, we posit that establishing a data-rich culture requires at least five components: (1) leadership support, (2) a collaborative data team, (3) a regular time to meet, (4) a central location for data, and (5) alignment of resources. Each component is described below, along with pertinent information from our site visits.

Leadership Support

The leadership of the school sets the tone, priority, and mission for school and staff. A leader well trained in using data—or just one supportive of its use—can create a ripple effect within the school. The leadership also sets the priority of collective responsibility for using data by ensuring that the other four components (e.g., collaborative data team, time to meet) are in place.¹⁷ State and district policy are important in ensuring that leaders at the school level are supported in implementing a data community. Nationally, advocating and expecting leaders to use data in planning, running, and carrying out the business of education is also equally important.

It is no surprise that the schools we visited with stable leadership tended to have more established processes in place and were positioned to begin addressing critical questions using data. The schools in which the principals had been in place for several years were able to establish a data use program and build upon and refine procedures and processes for not only collecting data but for using the information as well. These principals were more successful creating teams of staff with a variety of skills, providing the means necessary for professional development when needed, allocating resources such as time and equipment to data use, and establishing a schedule that allowed staff to meet collaboratively on a regular basis to discuss data.

Schools with newer principals were still just gaining their “sea legs” and understanding their new roles and responsibilities—even if they were veterans to the field but new to the school. Many times, these new principals were working with a schedule and budget that they had not created, were unaware of the many different software, hardware and/or other resources available, and were still in the process of assessing the skills of their staff and the necessary resources.

Creating a Collaborative Data Team

Creating a team is probably one of the most important foundational components to creating a data-rich culture.^{18,19} Through a collaborative team process, data should be used frequently and regularly to discuss not only student outcomes, behaviors, attendance patterns, and results (formative and summative), but also teacher inputs. Instructional reflection, such as the way in which the material was presented, the order, the amount of time given, the questions asked, and what was asked of the students are all also critical “data” to consider. One way to deconstruct teaching practice is to observe one another or video tape classes and get together to discuss, thus adding data points by which to better understand the teaching and learning process. To successfully analyze and collect data and ask and answer difficult questions, staff need a collaborative, safe place to discuss one’s own successes and—equally as important—shortfalls; without trust and collaboration, moving the conversation to this latter list will not be constructive. Creating such a place requires more than inviting people to a meeting. Creating a collaborative team requires a strategy and a great deal of effort. Figure 3 illustrates critical components of a collaborative team

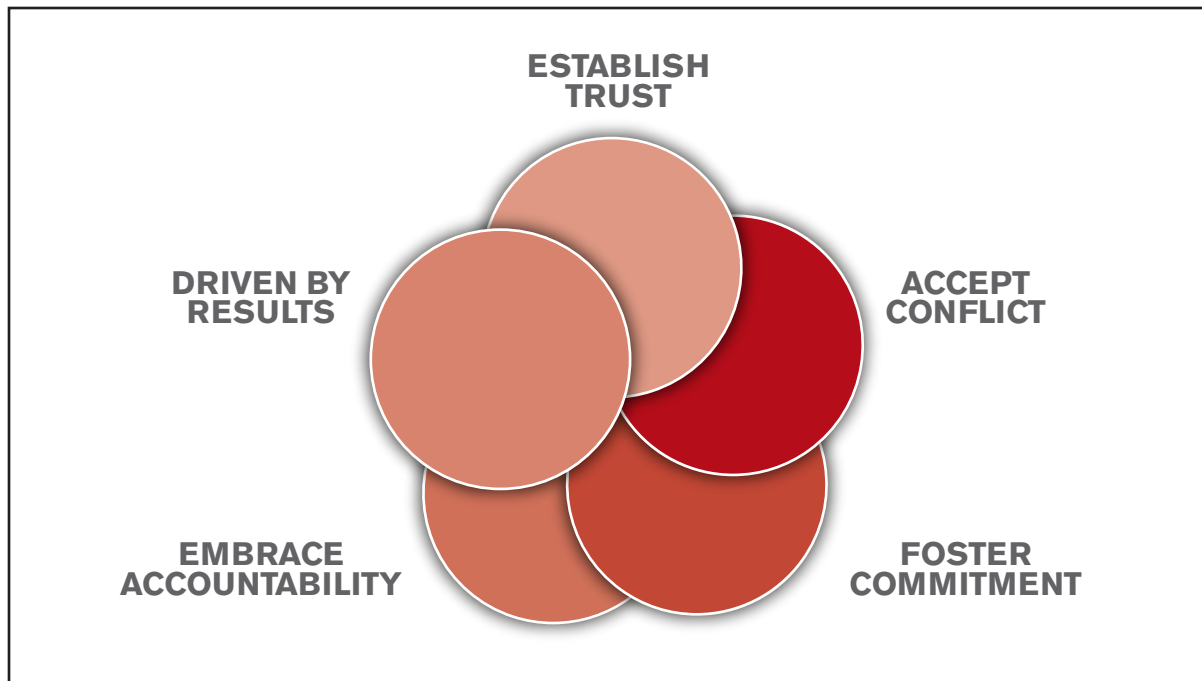
¹⁷ Parker Boudett, K., City, E.A., Murnane, R.J. (2007). *Data Wise: A Step-by-Step Guide to Using Assessment Results to Improve Teaching and Learning*. Harvard Education Press: Cambridge, MA.

¹⁸ Love, N (2002). *Using Data/Getting Results: A Practical Guide for School Improvement in Mathematics and Science Education*. TERC: Cambridge, MA.

¹⁹ Parker Boudett, K. et al. (2007).

BUILDING A DATA COMMUNITY

FIGURE 3: CREATING A COLLABORATIVE DATA TEAM



Source: adapted from: *Five Dysfunctions of a Team* by Patrick M. Lencioni

Establishing trust: Trust is the foundation on which a great team is built. It encompasses trust in each other and trust in the data. Without trust, both from the leadership and each other, team members will not be encouraged to grow.

Acceptance of conflict: Conflict can be a negative and a positive within a team. If members do not feel open enough to speak their mind, no real progress will be made. But if there's a lack of trust and members speak their mind in a disrespectful way, progress will be hindered as well. Conflict allows the team to mature, but only if the other pieces of team are established along the way.

Foster Commitment: Commitment needs to be established within the team members and/or nurtured throughout the process to avoid burnout or bored-out.

Embrace Accountability: Holding each other accountable to the process and to the students creates a collective responsibility wherein all members are equally answerable.

Driven by Results: the Cheshire cat in *Alice in Wonderland* said it best: "if you don't know where you're going, any road will do." Unless goals are established by the team around what they want to accomplish with using data and the team strive for those results, the time will be wasted.

In the schools we visited, we found that staff used the scoring of constructed response items on the DC BAS as a way to establish a team around data. Every six weeks, all teachers (or in some schools, all staff), including elective teachers would get together and score the constructed response questions. Scoring in a group

ensured collective understanding and responsibility in that all staff knew where students were doing well and struggling. The staff was tasked to build on any identified weaknesses in students' skill sets and incorporate the areas of strength into their class regardless of subject area. Other schools mixed teachers and staff of differing grade levels and subject areas by design to begin to build vertical alignment among the grades and share information across staff. For example, by grading 4th grade reading questions, the PE teacher was aware of what was expected of a 4th grader in reading, and a 2nd grade teacher would become knowledgeable of 6th grade math expectations by grading those responses.

One school created a professional learning data team consisting of the counselor, several teachers and the Assistant Principal. The team met to analyze, reflect and plan using data with all staff, but the team also hosted workshops for the staff to build skills where needed and develop data analysis capacity among the staff. The team met over the summer and created a calendar of professional development offerings and scheduled meeting times and dates. These offerings were based on the skills of the teachers; what the team could teach others as well as what the teachers needed. Establishing such professional learning communities could be a highly effective collaborative data team arrangement.

Establishing a Regular Time to Meet

Collecting and analyzing data takes time and focus. Without time set aside for this work to take place, most schools will not get farther than collecting the information, if that far at all. Instituting a regularly set time for the team, and/or sub-team to meet to collectively review, reflect, question and plan using the data most effectively ensures data are used strategically to make decisions.²⁰ If the data team is a subset of staff, regularly scheduling time for the data team to meet with the full staff is also needed. Protocols for asking and answering questions should be established and goals should be set and reviewed each month.

As a district mandate, all schools had time from 8:00-8:40 a.m. to use for staff meetings, collaborative work, and data discussions. Few schools built in additional planning time to be used as collaborative time when teachers could get together to discuss data, share lesson plans, plan units, talk about students, and discuss curriculum. There were several reasons for this. Some schools were unclear about how to use this collaborative planning time and it often ended up being wasted time from the leadership's perspective or not worth the effort of incorporating it into the schedule. However, some schools had such a limited number of staff—without corresponding reduction in the number of classes—that squeezing out any more time in the schedule for teachers to get together was impossible. The district mandates that teachers are assigned to schools based on enrollment, but the district does not take into account the need at the middle school level for additional classes. Schools with particularly low enrollments were most affected by this policy. Therefore, because of such typical time limitations of 30-40 minutes, data discussions were quick, infrequent, and not very substantive. Discussions about data coincided with the DC BAS, taken by students every 6 weeks. These discussions focused on how many students scored proficient, how the school compared to other schools in the district, and the areas teachers needed to re-teach. Decisions using data tended to be made by one or two staff members and relayed to the team during this time instead of the team responding to the information and making informed decisions as a group.

Policies at the district, state and national levels can be altered to support the use of data in schools. Creating aligned systems for education within and across levels of education and providing resources and materials (including relevant data tools and applications) aligned with common standards would provide a beacon toward which teachers can steer their instruction, assessments, and students' performance.

²⁰ Parker Boudett, K. et al. (2007).

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Securing a Central Location for Data

Data that are not linked and/or integrated across programs provide an incomplete picture of student progress. When information must be pieced together, it is rarely done. Warehousing demographic information with attendance, behavior, grades, and achievement measures will allow staff to construct more meaningful interventions, assess their own success in working with different learners, and identify areas in need of improvement from a students', teachers' and schools' perspective.²¹ Ideally, this central location would be electronic and web-based, accessible 24-7 by all from any location with Internet access. Software should also be easy to use and staff should be fully trained to use the software efficiently.

However, the schools we visited did not always have the resources to create an electronic “data room,” so they created a physical one. For example, a school created a data room that they use to showcase and display test data, attendance, reading levels, and similar data. In addition to teachers using the room, students and parents were also given access so they were knowledgeable about their own or their child’s data. Students especially enjoyed bringing their parents to the room when they had made growth over time. This allowed data to be used, and conversations to be had even when the team was not meeting. In another school, all teachers had a data notebook to centrally organize the data they received about their students at the beginning of the year, the data they collected over the year, as well as any data-related materials they received throughout the year (e.g., tools, guides, workshop materials).

Aligning Resources

Resources may be defined broadly, but are absolutely necessary. This includes human capacity (such as well trained staff), training opportunities (such as workshops and courses) and materials (such as computers and software). Often, schools, including those in DCPS, tend to have many resources but they may or may not be aligned to the priorities of the school, district, and/

or state. Therefore, resources are often used piecemeal, rather than strategically toward a common goal. Leadership and/or Data Teams that establish using data as a priority need to outline the work ahead and make certain that staff have the resources they require (e.g., the skills necessary to collect, analyze, and plan using data, software, hardware, and other supplies to complete the work). Districts and states that align their priorities tend to have an easier time aligning resources and therefore provide what is needed to the schools to meet such goals.

Staff

During our site visits, we found that the schools that struggled most were those with the leanest staff. They were also the schools that had data quality concerns because there was no one person designated to regularly collect the information needed. Alternatively, a process was needed to ensure that multiple staff collecting information did not translate into multiple ways of collecting the information. We identified two critical positions that facilitated data collection and use:

- **Attendance Officer:** The attendance officer enters attendance every day in STARS and then informs teachers which students are absent, tardy, and so forth.
- **Coaches/Data Team Leaders:** These staff usually held professional development sessions with teachers, topics consisting of system requirements on the computer, how to use the poster maker as well as how to break down the results of the students DCBAS, Accelerated Math, or other data elements. They work with teachers to create long-term plans and goals and then back map what students need to learn along the way in order for them to reach those goals.

²¹ Love, N., Stiles, K., Mundry, S., DiRanna, K. (2008). *Data Coaches Guide to Improving Learning for All Students: Unleashing the power of collaborative inquiry*. TERC: Cambridge, MA.

Training

Several school leaders received DataWise training. This training helped to standardize language used at the school around data, as well as provide a process for collecting and analyzing test score data. Schools with time and staff provided in-house training on the process and began to build staff capacity to work with data. As a district mandate, staff need to be trained in the procedures and processes used around data use in order to be truly effective.

Materials

Those we interviewed expressed a lack of confidence in the current district software and hardware. There is a need for training to utilize the full capabilities of the resources the schools have been offered.

One resource making data use easier is a student information system by which to store and organize student information. The schools were confident there were other capabilities within STARS that were not being used that might be helpful, but they had not been trained on any part of the system other than to record attendance or look up student demographic information. For example, school coaches sat with principals for extended periods of time attempting to schedule classes in a building that holds elementary and middle school students; STARS has a scheduling function but no one knows how to use it. Currently, STARS is not seen as a school tool, but as a district mandate where attendance data and middle school grades must be uploaded.

The schools also showed wide variability in their levels of comfort and knowledge in using many of the products purchased by the district or individual schools, such as Discovery Ed or Accelerated Math. As such, many programs are not being used as they were designed.

The case is similar with hardware. Because all buildings are not networked, much of the data kept by teachers is on their own computer.

As indicated, there were five major components needed to take the schools' use of data to further or full implementation: (1) leadership support, (2) a collaborative data team, (3) a regular time to meet, (4) a central location for data, and (5) alignment of resources. The schools we visited exhibited varying levels of establishing each but would greatly benefit from focusing on these precursors in attempting to better solidify their practice around the use of data.

USING DATA EFFECTIVELY

After creating a space and culture by which to use data and ensuring that the data are accurate, reliable and valid, what should a school do with the information? What information should be collected? What information would be helpful to analyze? How should information be analyzed? How often? Once analyzed, what should staff do with the results? These, and many others, are questions the staff will begin to ask themselves as they forge ahead in this process. Below, we describe how schools we visited fared in terms of the data-use process, as outlined by the "model" they have been trained to use: *Data Wise*.

Prepare

Preparing to use data requires an inventory of what data are currently being collected as well what data are needed.²² At the schools we visited, the amount of data collected at the middle school level is very slim in comparison to that collected at the elementary grades. For example, although there are middle school equivalents to DIBELS and Running Records to assess reading levels such as Scholastic Reading Inventory, Fountas and Pinnell, none of the staff we interviewed reported using these to assess older students. If the district has not yet vetted or determined resources to be used at the middle school level, it is not surprising that schools have not purchased any software/tools/resources due to budget constraints. The district and schools will need to focus on this, along with the PD to use these resources.

²² Parker Boudett, K. et al. (2007).

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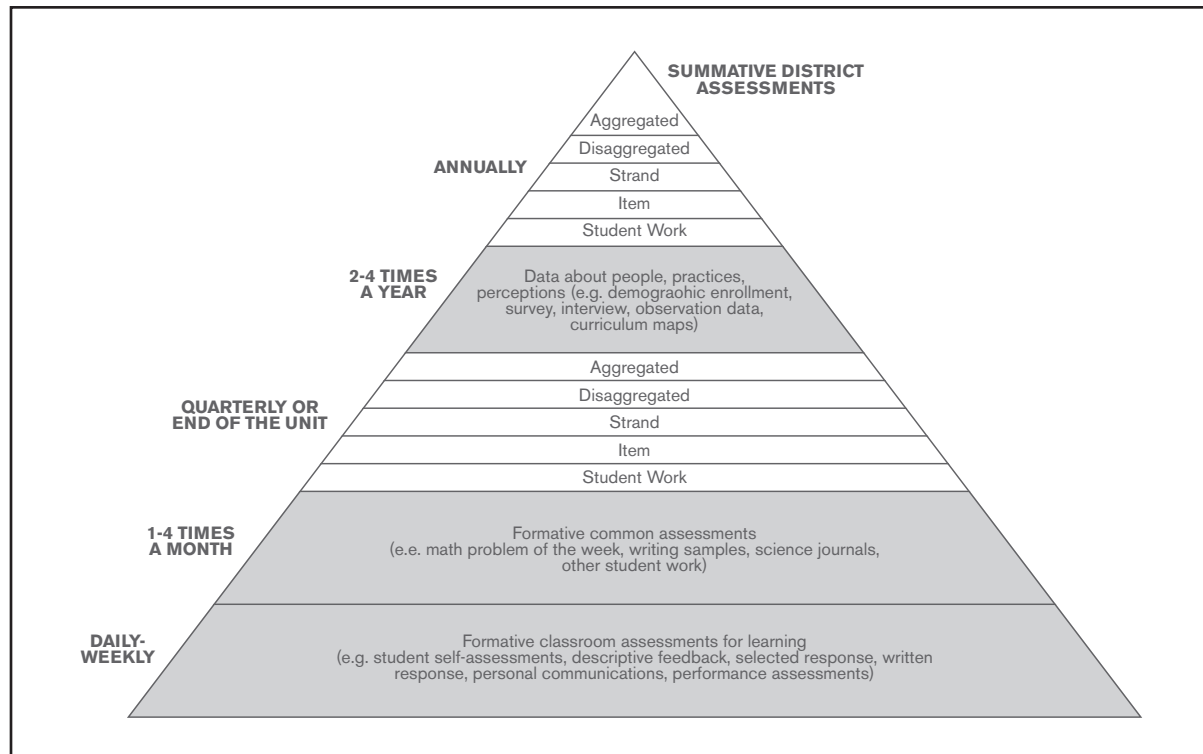
Inquire

The Inquiry Phase of using data effectively entails creating an overview analysis of the data as well as “digging” into the analysis to the root of the problem in question.²³ Staff that we interviewed discussed using DC BAS data as their sole source of inquiry. However, other sources of information are also critical for examining student and school performance and well being, as indicated in Figure 4. Is attendance a problem? What about staff retention? Test data are just one piece of a larger puzzle. It is like a check engine light being on or off—when the light is on you know there’s a problem, but you’re not sure what it is. When the light is off, you figure things are moving along smoothly even though your brakes may be failing or your battery running low. Focusing only on test scores without also analyzing additional information will result in an incomplete understanding of the situation and even less understanding of how to resolve it.²⁴

For example, what if the student was absent repeatedly prior to a test and they missed valuable information? What if they have been getting into trouble lately and spending time in detention or suspended instead of in the classroom? Should you drill them in finding main ideas if they got these questions wrong or try to build up their reading level? Or both?

These questions and many others cannot be explored in isolation – or with isolated data. One suggestion for the types of data to analyze and how often can be found in Figure 4. The best use of data comes not necessarily from assessment results of formal tests but from the strategic reflection of daily interactions with students.

FIGURE 4: USING COMMON ASSESSMENTS AND OTHER STUDENT LEARNING DATA SOURCES



Source: *The Data Coach's Guide to Improving Learning for All Students* by: Nancy Love, Katherine Stiles, Susan Mundry, Kathryn DiRanna

²³ Parker Boudett, K. et al. (2007).

²⁴ Koretz, D. (2008) *Measuring Up: What Educational Testing Really Tells Us*. Harvard University Press; Cambridge, MA.

Act

As stated earlier, the purpose of collecting data is to use it as a tool to provide feedback on students' abilities to guide instruction. The staff we interviewed discussed how information was collected in the schools, but provided little information about how the data were actually being used to improve staff practice and increase student outcomes.

The leadership staff across DC had received training from Harvard's data use strategy, *DataWise*. However, since staff responsible for the work had not received the *DataWise* training directly, their knowledge of the full process was incomplete. The assessment data were mostly used to group students or dictate which topics teachers had to focus on. Using the data to engage in dialogue about their own teaching, for example, was missing. Utilizing data to build content mastery among students and teachers was also missing. If staff is going to continue to use assessments as the only data to examine student progress, it is important to reflect on student-level performance in addition to school-wide trends.

The kind of action taking place in the schools we visited is not necessarily what one would hope for. Such a strong focus on test scores and increasing such scores may push schools to make decisions with the right intention but a lack of foresight to the consequences of students' overall educational well being.

For example, one school used data to track students' academic abilities in their elementary literacy blocks by having the trained reading specialist work with the students that were close to proficiency and above, while the PE teacher taught the very low-level students. These two teachers worked closely together and the reading teacher supplied the PE teacher with resources and lesson plans, but one could argue that the low-level reading students needed the experienced reading teacher the most. From the school's perspective, there was more value in bumping the students just below the passing threshold to proficiency and increasing the percent proficient in the grade than investing their strongest teacher with the students that had the farthest to go to reach proficiency. In another school, a content specialist resource math teacher with many years of experience co-taught with a 3rd grade teacher because this was the first year that she taught a "tested grade" and needed help in teaching the students testing techniques. One could argue that other teachers in the school could have used her support as well.

The schools we visited would benefit greatly from a district and/or state strategy outlining the purpose of using data, providing the leadership support needed, and assisting the schools in creating a team by providing the time and resources and training to do this work, as well as a central location to collect, analyze, and house the valuable data being generated and utilized.

CONCLUSION

When asked about a long-term vision for future data use, the schools we visited did not express an ideal much different from where they currently are. The schools had certainly accomplished much. In a district where most everything is still kept in hard copy—grade books, report cards, even attendance records as required by the court—establishing procedures to collect and analyze data electronically is a mountain to move.

However, schools still have the rest of the mountain range to go in terms of DCPS' likelihood and readiness to create and use an Early Warning Indicator. There are several concerns that must be addressed before such a tool can be effective in identifying and supporting students at risk of dropping out of school.

The first issue is the quality of the data. Several critical measures to an early warning indicator—date of birth, attendance, grades, withdrawals— are being collected in different ways at different schools, not allowing for cross-school comparisons or data to be rolled up. Measures such as date of birth require internal checks and parameters instituted to ensure erroneous information is not included in the dataset. Some of these data, such as grades, are not required to be entered electronically and are therefore missing from the database.

The second issue is the lack of a sufficient longitudinal dataset due to practices around issuing student identification numbers and the inability to follow students from public to charter schools. Because students may be assigned more than one identification number, creating a database that follows students over time is difficult. With the large number of charter schools in the District, and more being added every year, the district will need to facilitate a way to identify the schools students are attending regardless of whether it is public or charter. Otherwise students get “lost” in the system and are not counted as part of the longitudinal dataset when they attend a charter school.

The third issue is the foundation of a data community within the schools. Schools and staff have more data to work with than ever before. However, they are still struggling to obtain the foundational pieces needed to really be able to utilize these data. One of the key components missing was the time to collaborate. Teachers and staff had little time – or had no real impetus to make the time – to review, reflect, or plan using the data. Teachers not having much time to get together to discuss their practice meant that while they were a “team,” they were not a collaborative team; they were not learning, growing, or improving by reflecting on the data as a group. The other key element missing were resources aligned to such data work: training and assignment of staff dedicated to collecting and analyzing data.

Lastly, schools will need to push forward in collecting a comprehensive set of data that best helps them support their students. Observing assessment data every six weeks in isolation means that mid-course corrections of subject matter, changes in teaching strategies, and refinement in resource allocation will only occur six times a school year, at most. Struggling students need facile teachers with the ability to assess their teaching and students' learning daily in order to accelerate learning. Until then, “using data to drive instruction” will continue to be a misnomer, one that is spoken but not really accomplished.

APPENDIX

TOPIC IN FOCUS: AN EXAMINATION OF STUDENTS OVERAGE FOR GRADE

INTRODUCTION

The purpose of an early warning indicator is to identify students at risk of failing school in time to effectively intervene. One of the strongest predictors of high school dropout is being overage for grade, defined as a year (or more) older than grade-cohort peers. Overage for grade is often a proxy for grade retention, whereby students are held back a grade due to poor academic performance. The assumption is that another year of development and another year learning the same material, possibly with additional supports, will prepare struggling students to successfully transition to the next year. While research does not bear out this assumption, being overage for grade in middle and/or high school is a strong predictor of disengagement and dropping out.¹ In fact, dropouts are five times more likely to have repeated a grade than their peers, and students who repeat two grades have nearly a 100 percent probability of dropping out.²

In this brief, we examine overage students in the District of Columbia as a warning signal for significant performance issues and dropping out of school. Specifically, we use DC Public Schools (DCPS) administrative data for 6-9th graders in 2007-08 to identify students overage for grade, and then examine their academic and demographic characteristics, as well as the characteristics of their schools and communities.

MEASURING OVERAGE

Because DC does not have a birthday cutoff for enrollment,³ we calculated *OVERAGE*⁴ using non-rounded numbers and creating dichotomous variables (overage=Y/N) for each grade level:

- 1) A sixth grader is overage if s/he is 12 years or older during the first half of the school year.
- 2) A seventh grader is overage if s/he is 13 years or older during the first half of the school year.
- 3) A eighth grader is overage if s/he is 14 years or older during the first half of the school year.
- 4) A ninth grader is overage if s/he is 15 years or older during the first half of the school year.

In the DCPS administrative data, there was minimal missing data for date of birth. However, there were inconsistencies in values, including years that were obviously much too early or much too late for middle grade students. We were able to clean up these data errors to appropriately calculate age using the following steps:

Where the student had at least two DOBs (e.g. one DOB for 2006 and another for 2008):

- 1) If the year and month matched, but the day differed, the student was assigned the DOB with the earlier date (e.g. 09/06/1981 and 09/05/1981, I changed DOB to 09/05/1981)
- 2) If month and day were the same, but the year was different, the variable was not changed.
- 3) If date and year were the same, but the month differed, the variable was not changed.

Where the student had at least 3 DOBs:

- 1) If 2 of the DOBs matched and one differed, the DOB from the matched set was used.

We then computed age as school year minus the date of birth year and then created overage variables as described.

FINDINGS

The percentage of overage DCPS students in grades 6-9 has been slowly increasing, from an average of 40 percent in 2005-06 to 43 percent in 2007-08. In 2007-08, about 1 in 4 6th graders was overage and more than half of 9th graders were overage (see Figure 1).

In grades 6-8, a vast majority of overage students were 1 year overage for grade and a very small proportion of students were 2 or more years overage (Figure 2). This pattern changes in 9th grade, where almost half of the overage students are 2 or more years overage.

Using overage for grade as a warning signal, the data indicate that in 2007-08 more than half of DCPS students in grade 6-9 (more than 6,000 adolescents) are at risk of dropping out of high school before graduation (Figure 3).

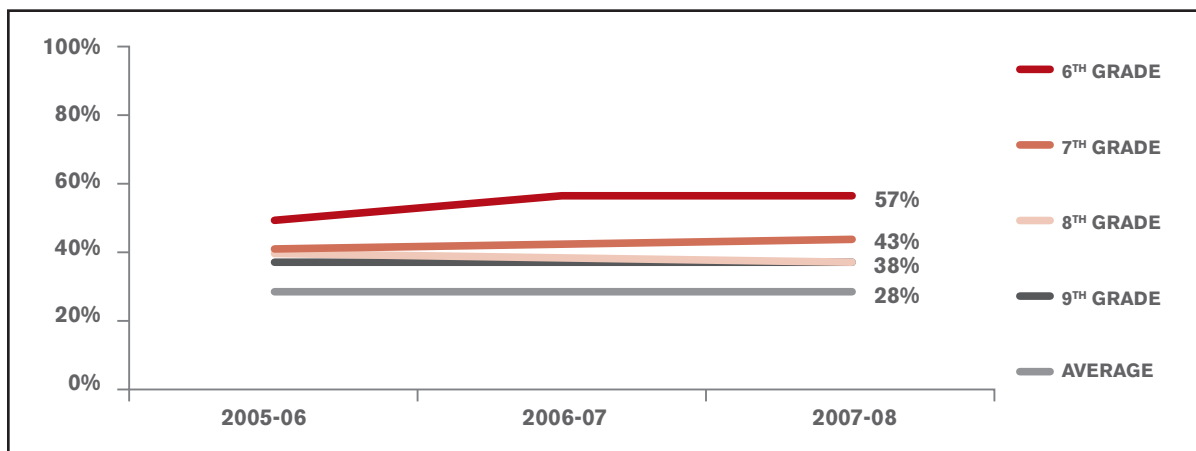
1 Rumberger, 1995.

2 Roderick, 1994; Shepard & Smith, 1990.

3 For a student to enroll in kindergarten, they must turn 5 years of age by December 31st of that year.

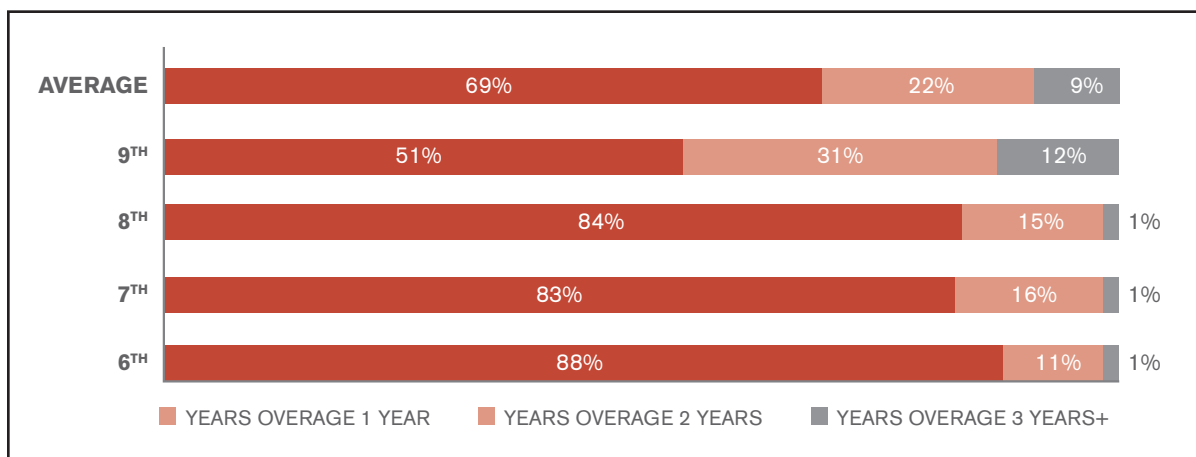
4 The age-cutoffs used to determine overage status were from Baltimore Public School's work entitled *Overage Students in the BCPSS*.

FIGURE 1: PERCENTAGE OF STUDENTS OVERAGE BY GRADE LEVEL: 2005-06, 2006-07, 2007-08



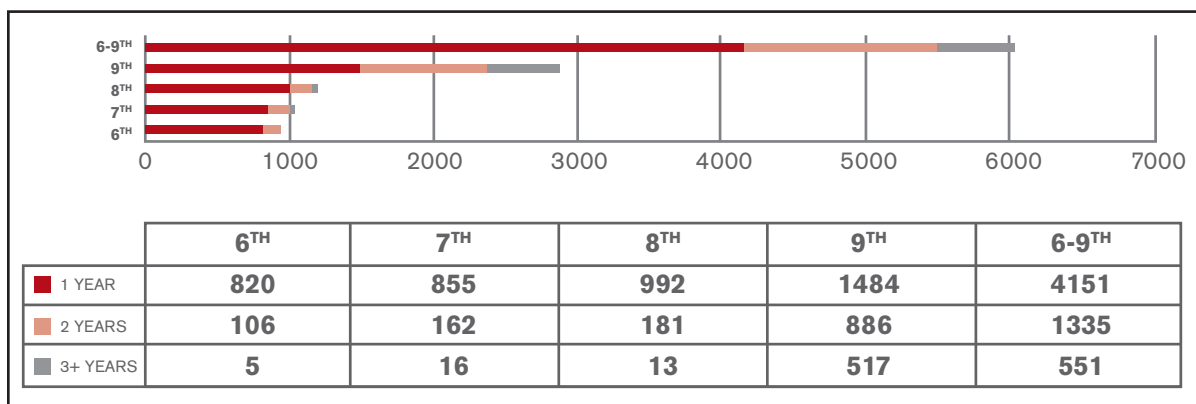
Source: DCPS Dataset from DCPS Data Diagnostic, Center for Education Policy Research at Harvard University

FIGURE 2: PERCENT OF OVERAGE STUDENTS BY YEARS OVERAGE AND GRADE LEVEL, 2007-08⁵



Source: DCPS Dataset from DCPS Data Diagnostic, Center for Education Policy Research at Harvard University

FIGURE 3: NUMBER OF OVERAGE STUDENTS BY YEARS OVERAGE AND GRADE LEVEL, 2007-08



Source: DCPS Dataset from DCPS Data Diagnostic, Center for Education Policy Research at Harvard University

⁵ The number of students on-age (and number of students with missing data) is as follows: 6th: 2190 (7); 7th: 1701 (17); 8th: 1950 (9); 9th: 2149 (18).

TOPIC IN FOCUS: AN EXAMINATION OF STUDENTS OVERAGE FOR GRADE

AN INTRODUCTION TO THE SCHOOLS AND STUDENTS IN THE DISTRICT OF COLUMBIA

In 2007-08, there were approximately 14,000 6th-9th graders enrolled in 116 public schools (see Tables A and B). Wards 5, 7, and 8 had the greatest number of 6-9th graders enrolled in DC public schools, as shown in Table C.

Table A. Number DC Public School Students Enrolled in Grades 6, 7, 8, or 9, 2007-08

	N	%
Grade		
6th	3128	22%
7th	2751	20%
8th	3145	22%
9th	5054	36%
Total	14078	100%

Table B. Number of DC Public Schools Enrolling Students in Grades 6, 7, 8, or 9 by Grade Range, 2007-08

K-6	6-8	7-9	K-8	9-12	Total
71	12	8	6	18	116

Table C. Student Enrollment in DC Public Schools by Grade and Ward, 2007-08

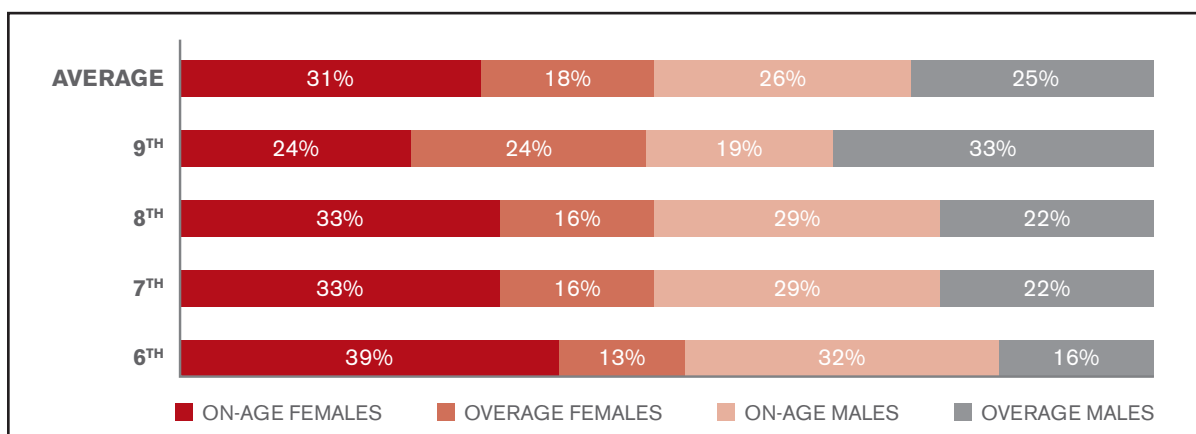
Ward	6th	7th	8th	9th	Total
1	292	314	435	867	1908
2	186	218	216	220	840
3	230	304	284	405	1223
4	435	209	266	568	1478
5	281	159	175	1005	1620
6	408	571	588	414	1981
7	574	487	555	358	1974
8	722	489	626	1217	3064
Total	3128	2751	3145	5054	14078

STUDENT DEMOGRAPHICS

Averaging across grades 6-9, males were about one and one-half times more likely to be overage than females (Figure 4). In 6th grade, twice as many male students were on-age than overage. By 9th grade, this had flipped; substantially more males were overage than on-age (33 and 19 percent respectively). By 9th grade, female students were divided evenly between on-age and overage.

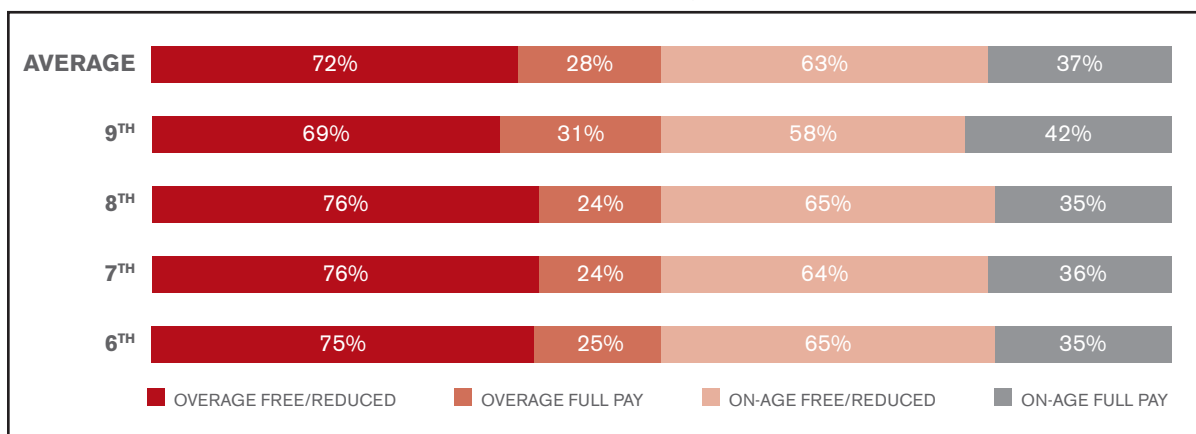
Overall, almost 70 percent of all DCPS students were poor (they qualified for the federal free or reduced-price lunch program) in 2007-08. Overage students were more likely to be poor than their on-age peers (Figure 5). Almost three-quarters of overage students in grades 6-9 were poor; whereas, approximately two-thirds of on-age students were poor. These trends were consistent across grade levels and prior years. There was little difference between students' race and whether or not they were overage or on-age for grade.

FIGURE 4: PERCENT OF FEMALES AND MALES ON-AGE AND OVERAGE BY GRADE LEVEL, 2007-08



Source: DCPS Dataset from DCPS Data Diagnostic, Center for Education Policy Research at Harvard University

FIGURE 5: PERCENT OF STUDENTS QUALIFYING AND NOT QUALIFYING FOR FREE OR REDUCED-PRICED LUNCH ON-AGE AND OVERAGE BY GRADE LEVEL, 2007-08



Source: DCPS Dataset from DCPS Data Diagnostic, Center for Education Policy Research at Harvard University

TOPIC IN FOCUS: AN EXAMINATION OF STUDENTS OVERAGE FOR GRADE

MATHEMATICS AND READING PROFICIENCY

The most important data points in Table 1 are the percentages of DCPS students proficient in mathematics and reading—less than half of 6-8th graders were proficient in each content area in 2007-08.⁶ Averaged across grades 6-8, only about one-fifth of overage students were proficient in mathematics and one-quarter in reading. Approximately twice as many on-age students were proficient in mathematics and reading than overage students across all grade levels.

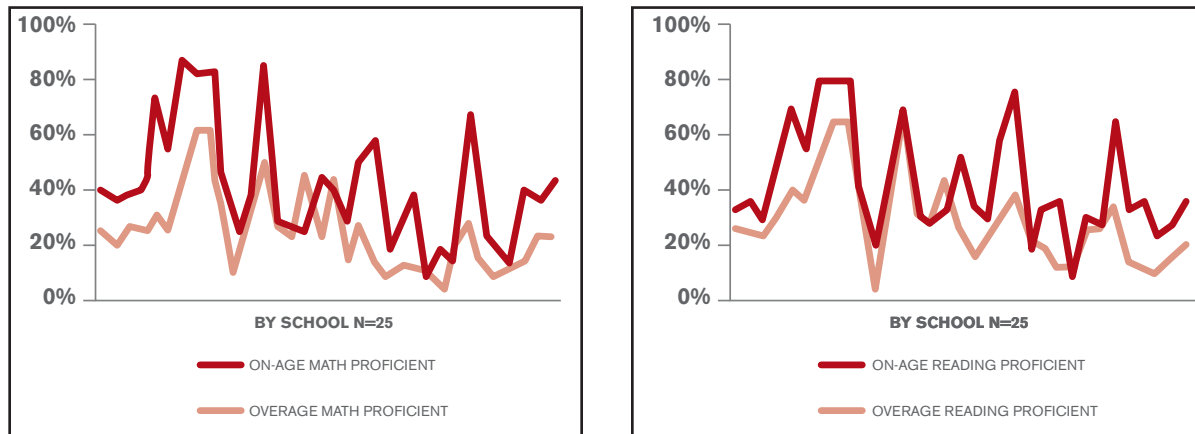
The relationship between proficiency and overage status is clearly illustrated in Figures 6 and 7. In 22⁷ of the 25 schools enrolling 8th graders, overage 8th graders exhibited lower proficiency than their on-age peers. The patterns indicated below are consistent with 6th and 7th grade proficiency rates.

TABLE 1: PERCENT (NUMBER) OF OVERAGE AND ON-AGE STUDENTS PROFICIENT IN READING AND MATH,⁸ 2007-08⁹

GRADE	PROFICIENT IN MATH			PROFICIENT IN READING		
	OVERAGE	ON-AGE	ALL	OVERAGE	ON-AGE	ALL
6th	22% (197)	40% (628)	37% (1095)	29% (257)	45% (1013)	43% (1270)
7th	19% (196)	42% (702)	36% (898)	19% (200)	44% (734)	38% (934)
8th	20% (232)	41% (803)	36% (1035)	23% (269)	42% (827)	38% (1096)
Average	20% (625)	41% (2133)	36% (3028)	24% (726)	44% (2574)	40% (3300)

Source: DCPS Dataset from DCPS Data Diagnostic, Center for Education Policy Research at Harvard University

FIGURES 6 AND 7: 8TH GRADE STUDENTS' PROFICIENCY IN MATHEMATICS AND READING: ON-AGE VS. OVERAGE, 2007-08



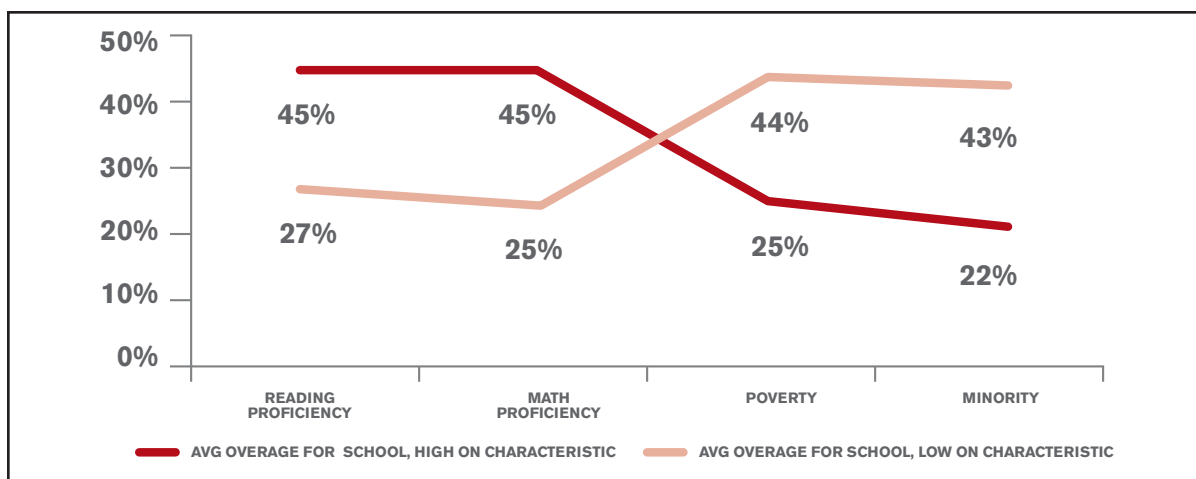
Source: DCPS Dataset from DCPS Data Diagnostic, Center for Education Policy Research at Harvard University

6 9th graders do not take the DC CAS.

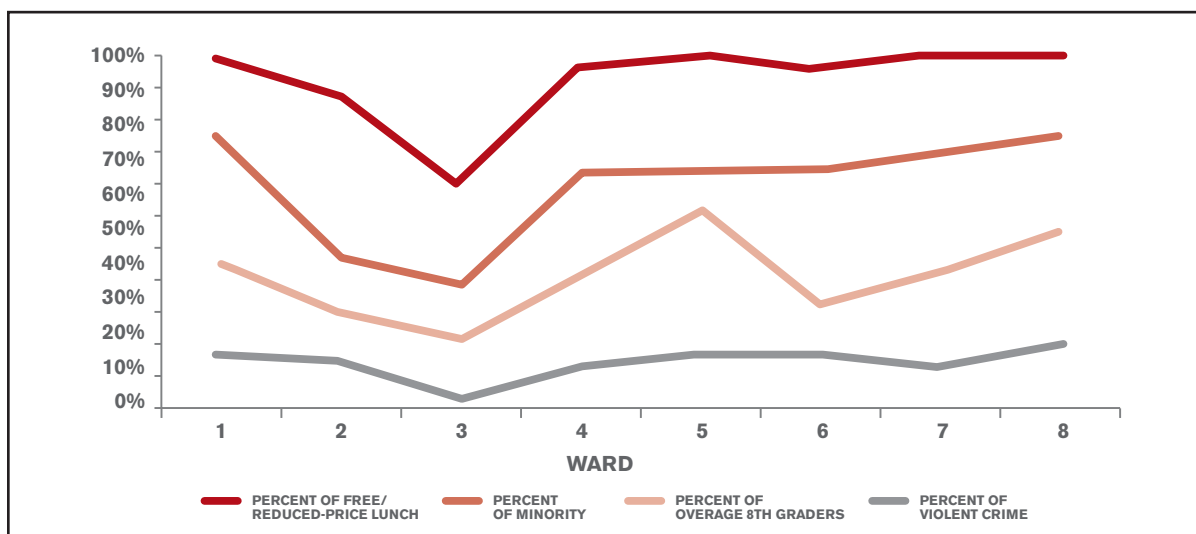
7 Schools that had higher percentages of overage students proficient than on-age students in math were Marshall Educational Center and Merritt Middle School and in reading: Browne Junior High School, Marshall Educational Center and Merritt Middle School.

8 Eighth grade was chosen because while 9th grade had the highest percentage of overage students, and 8th grade was the tested grade with the highest percentage of students overage.

9 The number of students not proficient in Math (and number of students with missing data) is as follows: 6th: 1825 (208); 7th: 1584 (269); 8th: 1870 (240). In Reading, 6th: 1650 (208); 7th: 1548 (269); 8th: 1809 (240).

FIGURE 8: PERCENT OF 8TH GRADERS OVERAGE BY SCHOOL CHARACTERISTICS, 2007-08

Source: DCPS Dataset from DCPS Data Diagnostic, Center for Education Policy Research at Harvard University

FIGURE 9: SCHOOL DEMOGRAPHICS, VIOLENT CRIME AND 8TH GRADE OVERAGE STATUS BY WARD, 2007-08

Source: DCPS Dataset from DCPS Data Diagnostic, Center for Education Policy Research at Harvard University and Crime, Metropolitan Police Department

SCHOOL CHARACTERISTICS

Consistent with the research,¹⁰ high-minority and high poverty schools (higher than average for DCPS) had greater concentrations of overage students than other DCPS schools. Schools with higher proportions of proficient students (again, higher than average for DCPS) had lower proportions of overage students. Figure 8 illustrates this relationship for 8th graders; data for the other grades show similar patterns.

WARD

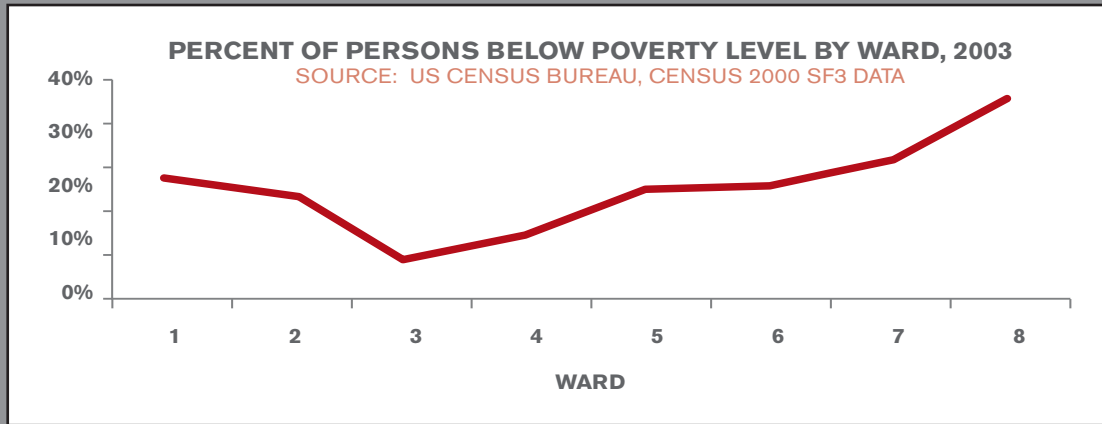
The District of Columbia is divided into 8 Wards, and as illustrated in Figure 9, there is substantial demographic variability among them. Ward 3, in particular, has much lower percentages of minority students, students receiving free/reduced-price lunch, and overage students than the other Wards. By contrast, Wards 1, 5, 7, and 8 are especially high on these measures. Violent crime follows the same trends.

¹⁰ Alexander, Entwistle, & Dauber, 2003; Bali et al., 2005; Bianchi, 1984; Corman, 2003.

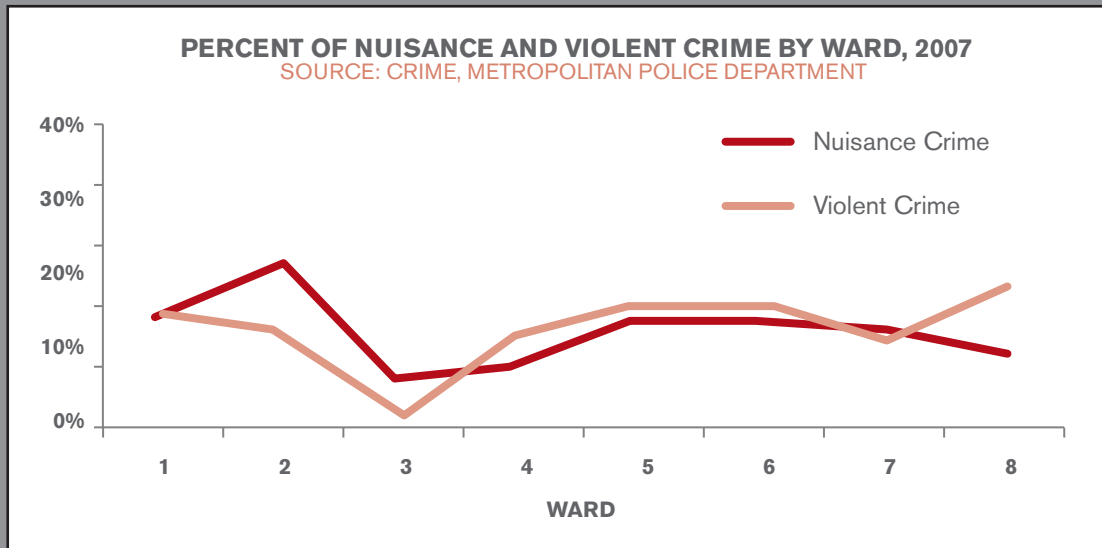
TOPIC IN FOCUS: AN EXAMINATION OF STUDENTS OVERAGE FOR GRADE

POVERTY AND CRIME IN THE DISTRICT OF COLUMBIA

Overall, roughly one-fifth of all DC residents lived below poverty according to the latest Census. Forbes magazine named DC one of the top 10 most expensive cities to reside,¹ so the federally-set poverty level of \$20,650² for a family of four may under-represent DC's poverty.



DC has also been named one of the top 20 most dangerous cities for several years in a row.³ A majority of overage students attend school in the highest crime areas of DC. Research suggests that overage students are more likely to participate in committing crimes than their on-age peers.⁴



1 Forbes.com: http://www.forbes.com/2009/10/07/most-expensive-cities-lifestyle-real-estate-america-top-ten_slide_2.html; downloaded March 12, 2010

2 Federal Register, Vol. 72, No. 15, January 24, 2007, pp. 3147–3148

3 QP Quarterly, 12, 13, 14th Annual Crime Statistics Report

4 Juvenile Crime/Juvenile Justice (2001). Commission on Behavioral and Social Sciences and Education. Behavioral and Social Sciences and Education. Washington, DC: National Academies Press.

Figure 9 indicates that more than half of the 8th graders in Wards 5 and 8 were overage and more than one-third of 8th graders were overage in Wards 1, 4, 6, and 7. Ward 3 had the lowest percentage of overage students (20 percent). This pattern is similar for 6th and 7th grades as well.

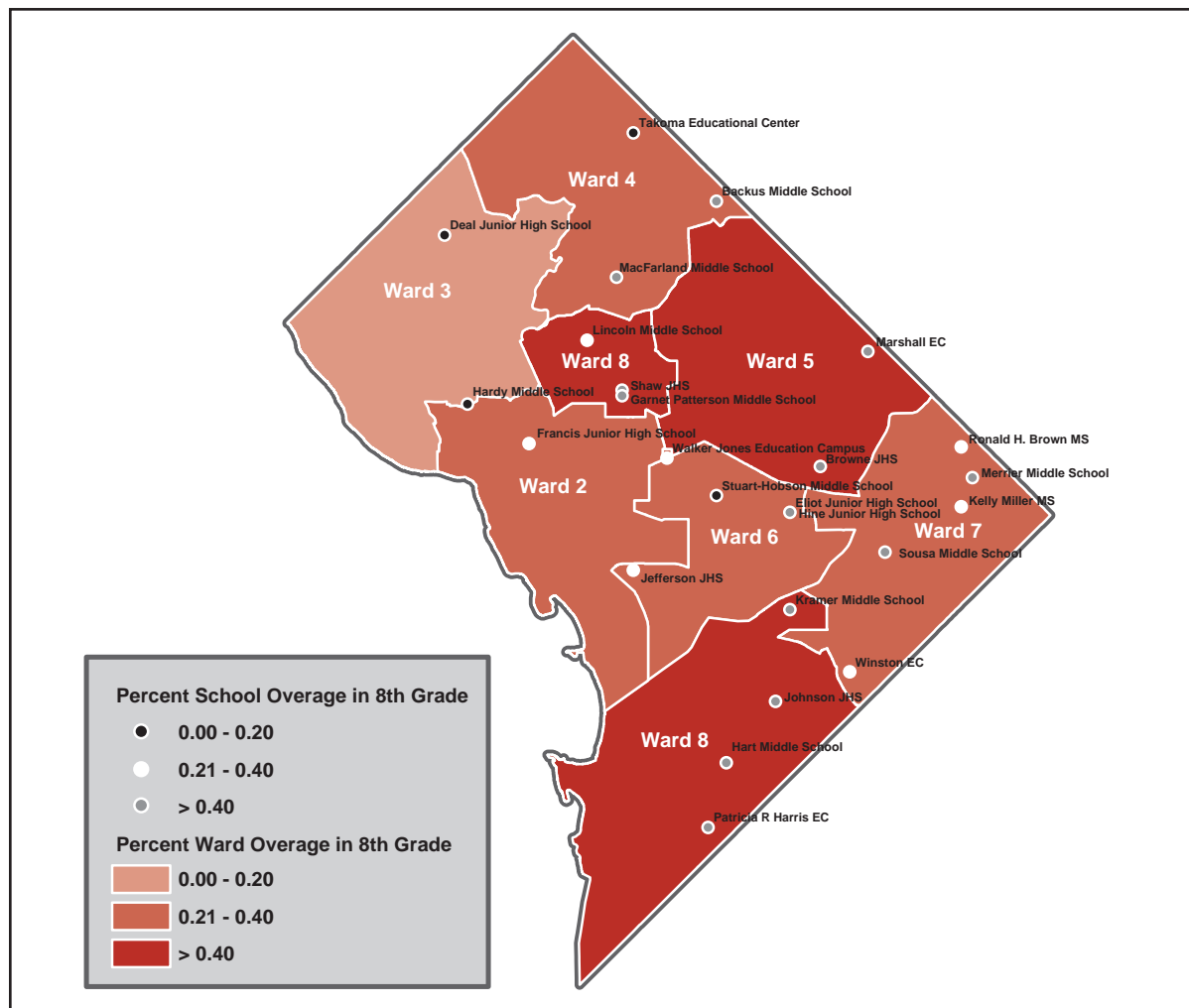
Map 1 illustrates the percentages of students overage by Ward, providing the location of schools and school concentration of overage students.

In Ward 5, 13 percent of overage 8th graders were overage 2 or more years and in Ward 8, 10 percent of overage 8th graders were overage 2 or more years (Figure 10). Ward 3 had very few students overage by 2 or more years.

In 8th grade alone, nearly 1,200 students were overage for grade and at risk for dropping out, with close to a third of them attending school in Ward 8 (Figure 11).

Figure 12 illustrates the relationship between 8th grade students' overage status and mathematics and reading proficiency, disaggregated by Ward. Wards 5, 7, 8 had both the highest percentages of overage students and the lowest percentages of students proficient on the DC state assessment. Ward 3, on the other hand, had the lowest percentage of overage students and highest percentage of students proficient on the DC state assessment.

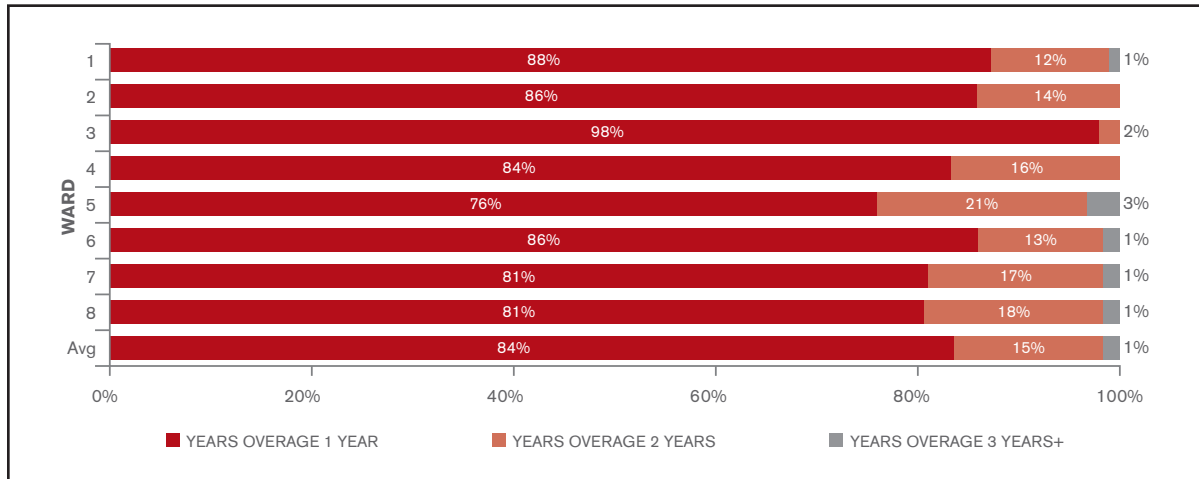
MAP 1: PERCENTAGE OF 8TH GRADE OVERAGE STUDENTS IN WASHINGTON, DC WARDS & SCHOOLS



Source: DCPS Dataset from DCPS Data Diagnostic, Center for Education Policy Research at Harvard University

TOPIC IN FOCUS: AN EXAMINATION OF STUDENTS OVERAGE FOR GRADE

FIGURE 10: PERCENT OF OVERAGE 8TH GRADE STUDENTS BY YEARS OVERAGE AND WARD, 2007-08



Source: DCPS Dataset from DCPS Data Diagnostic, Center for Education Policy Research at Harvard University

FIGURE 11: NUMBER OF OVERAGE 8TH GRADERS BY YEARS OVERAGE AND WARD, 2007-08

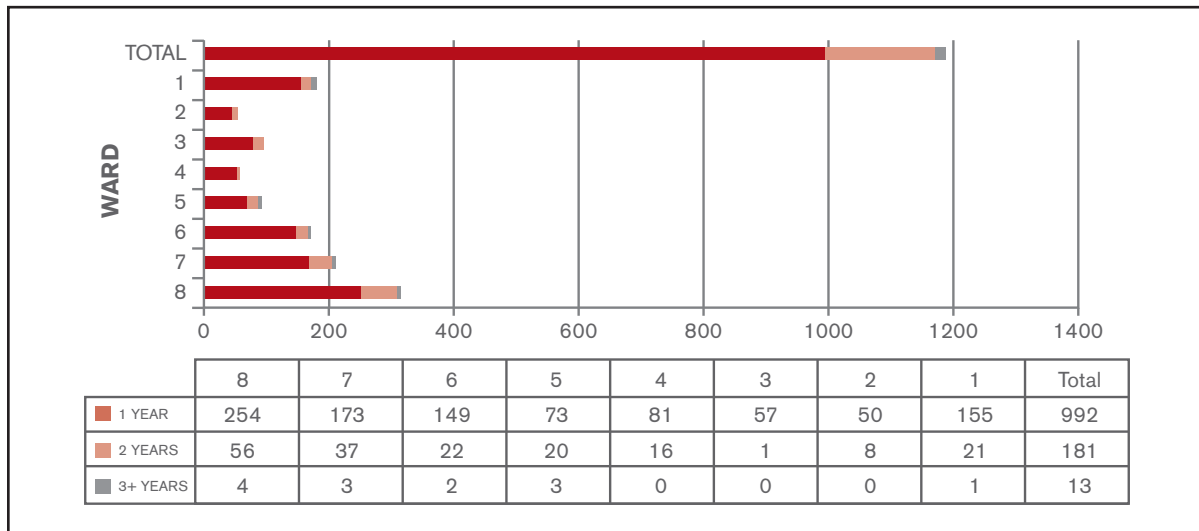
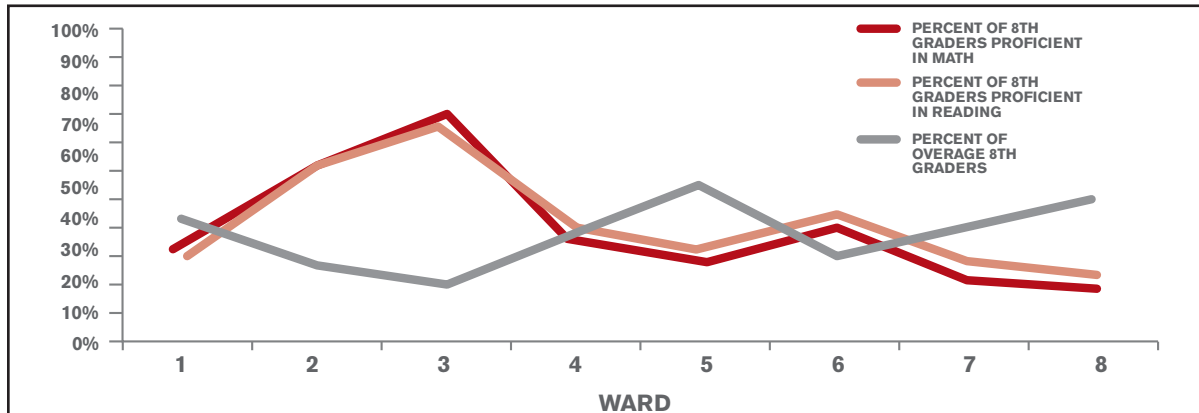


FIGURE 12: PERCENT OF 8TH GRADE STUDENTS PROFICIENT IN MATH, READING & OVERAGE FOR GRADE, 2007-08



Source: DCPS Dataset from DCPS Data Diagnostic, Center for Education Policy Research at Harvard University

CONCLUSIONS

The most significant and costly problem facing DCPS is the vast numbers of students dropping out of high school. An early warning signal that identifies students before they drop out will help DCPS leadership and school personnel target individual students and groups of students most in need of interventions and inform school improvement plans and decisions regarding intervention programs. Equally important, it will help district leaders plan for and make budget decisions regarding intervention programs, determine which schools to target for institution-level interventions and reforms, and inform planning for school-level and district-wide strategies.

Data presented in this brief provide an overview of one type of early warning indicator, overage for grade, and illustrate the characteristics and concentration of these students in the District. This brief highlights both the enormity of the problem, but also pinpoints the schools and areas of the city where the problem is most prevalent. Using individual and real-time data, DCPS could be armed with the early warning data necessary to improve student graduation rates in the city. Though not sufficient to keep students in school, this early warning indicator could be the first step in building a system of student and school supports that will turn around failing schools and also redirect students toward college and career success.

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