CPRE
CONSORTIUM FOR POLICY RESEARCH IN EDUCATION

From the Inside In: An Examination of Common Core Knowledge and Communication in Schools

WORKING PAPER

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About Consortium for Policy Research in Education (CPRE)

The Consortium for Policy Research in Education (CPRE) brings together education experts from renowned research institutions to contribute new knowledge to inform K-12 education policy and practice. Our work is peer-reviewed and open access. CPRE's member institutions are the University of Pennsylvania, Teachers College Columbia University, Harvard University, Stanford University, University of Michigan, University of Wisconsin-Madison, and Northwestern University.

Since 2010, CPRE has conducted the external evaluation of the *Developing Futures*™ in Education program for the GE Foundation. In addition to this report, CPRE recently published an evaluation on the impact of the *Developing Futures*™ in Education program on mathematics performance trends in four district.

About GE Foundation and the *Developing Futures*™ in Education Program

For more than 50 years, GE Foundation has invested in education programs based on a fundamental premise: A quality education ushers in a lifetime of opportunity, which helps build a strong and diverse citizenry to work and live in an increasingly competitive world. The GE Foundation believes that a quality education can help prepare young Americans – especially those in underserved urban districts – for careers in a global economy.

The GE Foundation is addressing this education imperative by supporting high-impact initiatives that improve access to, and the equity and quality of, public education. The *Developing Futures*™ in Education program is one such endeavor, created to raise student achievement through improved mathematics and science curricula and management capacity in schools. The program has been expanded with a grant investment of over $200 million in seven targeted U.S. school districts.

School districts use their grants to develop a rigorous, system-wide mathematics and science curriculum and provide comprehensive professional development for their teachers. Working with the GE Foundation, districts have made more efficient management of human resources using GE's Six Sigma, developing educational leaders to coach others and model best practices, implementing GE's process management tools, and developing IT systems and capacity to use data to better inform decision making. More recently, with GE Foundation leadership, partner districts have increasingly focused on implementation of the new Common Core State Standards.

Introduction

The challenge of building the capacity of a school system to meet the new expectations of the Common Core State Standards is actually an old problem in new clothing. How do school systems (either traditional districts or newer school management organizations) build the knowledge and skills of teachers across schools to teach differently to meet new, more ambitious, expectations? The critical assumption underlying this question is that if we want different student outcomes, then the teaching that produces those outcomes must also be different.

This problem has typically been addressed almost exclusively from the outside. Traditional tactics include some combination of organizational changes, externally crafted professional development, or incentivized accountability systems that are intended to catalyze teachers to develop new ways to deliver more effective teaching and produce higher learning. Because of their outside-in emphasis, these solutions almost inevitably under-attend to the existing knowledge and resources that resides within schools.

Both because of its size and culture, New York City has approached the challenge of implementing the Common Core more inside-out than most districts. While professional development remains an important part of the district's strategy, the district is particularly interested in identifying and positioning capacity from within schools to facilitate teachers' engagement with the Common Core. In this exploratory study CPRE researchers investigate how Common Core knowledge and instructional influence are arrayed in schools and how this might help an upward-out strategy for Common Core implementation.

Sponsored by the General Electric Foundation, which also provides support to New York City through its *Developing Futures*™ in Education Program, The Consortium for Policy Research in Education (CPRE) at the University of Pennsylvania has examined Common Core implementation in New York City in a series of studies. In 2013 CPRE released the findings of two investigations, one which described how the district constructed the 2011-12 Citywide Instructional Expectations (CIEs) for teachers, which were a small number of assignments for school faculties to complete during the school year to facilitate their engagement with the new Common Core (Supovitz, 2013). The second report examined how a diverse sample of 16 schools understood and implemented these CIEs and how their choices influenced their levels of engagement (Goldsworthy, Supovitz, & Riggan, 2013). A third report is a companion to the current report, focusing on teacher collaboration as a means of cultivating and transferring knowledge about the Common Core.

In this report we explore how Common Core knowledge and influence are distribute inside of schools and how these configurations may help teachers to engage with the Common Core and influence their understanding and implementation. To do so, we used a mixed-method approach to examine knowledge and influence in eight schools, including five elementary schools and three middle schools. Our central method was a survey of knowledge and influence of all faculty members in a sample of eight schools. These data are supplemented with interview data from a purposeful sample of teachers and administrators in the eight schools.

We found that:

» Overall, school faculty members scored higher on our English language arts (ELA) Common Core knowledge test than they did on the Common Core knowledge test in mathematics.

» Administrators and coaches scored higher on the Common Core knowledge tests in both ELA and mathematics than did classroom teachers.

» Administrators and coaches also sought out more external resources about the Common Core than did teachers.

» In the middle schools, ELA teachers were more likely than mathematics teachers to seek Common Core resources outside of their school.

» In both elementary and middle schools, there was wide variation in team knowledge and communication about the Common Core. Furthermore, there appeared to be little relationship between team knowledge and team advice seeking.

» There were 37 individuals across the eight schools who were statistically significantly more likely to be recipients of requests for assistance about the Common Core and performance assessments (a central emphasis of Common Core implementation in New York City). About two thirds of these influential individuals were administrators or coaches, while one third were classroom teachers. These influential people had significantly higher knowledge about the Common Core in both ELA and mathematics and also accessed more external resources than the other faculty members in the sample.

» Knowledge about the Common Core was related to more requests for assistance from colleagues, indicating that teachers were able to identify and utilize sources of knowledge in their schools.

» There was also a significant relationship between seeking knowledge resources outside of the school and requests for assistance about the Common Core.

» Finally, and importantly, knowledge is related to seeking external resources in ELA, but not in mathematics. That is, those who reached outside the school for more resources also had more Common Core ELA knowledge.

Theoretical Rationale for Well-Positioned Expertise

Theory and empirical research on the benefits of both organizational knowledge and well-positioned social capital provide a rationale for identifying, developing, and positioning knowledgeable individuals within schools. Theorists have made several distinctions between different types of knowledge, including individual knowledge and organizational knowledge (Tsoukas & Vladimirou, 2001) as well as tacit and explicit knowledge (Nonaka, 1994). Organizational knowledge is considered to be knowledge that is shared across the organization and may be encoded into the routines that make up regular organizational practices (March & Olsen, 1976). Benefits of organizational knowledge include more effective management of intellectual capital (Stewart, 1997) and the facilitation of innovation (Hamel & Prahalad, 1994). Tacit knowledge, what Nonaka (1994) calls "know how", is thought to be shared through regular and collegial interactions focused on the work practices of organizational members (Lave & Wenger, 1998; Nonaka, 1994).

Social capital is a way of distributing knowledge amongst individuals within an organization. Sociologists define social capital as the cumulative knowledge and resources residing within a cultural unit that individuals can access through interactions with others (Coleman, 1990; Lin, Cook, & Burt, 2001; Portes, 2000). Abundant social capital provides access to an array of physical, intellectual, and social resources that benefit both individuals and their communities (Putnam, 1993). Schools, as micro societies, provide a classic arena for the distribution and positioning of social capital.

The predominant way in social science research of studying social capital is through the analysis of social networks. Social networks represent the way that individuals interact and transfer resources (Lin, 2002). Social network analysis can be used to examine the ways that structural positions in a network facilitate information access and therefore to social capital (Burt, 2001; Lin, Cook, & Burt, 2001). Theorists suggest that the underlying social structure determines the type, access, and flow of resources amongst actors in a network (Daly, 2010; Cross & Parker, 2004). Social network analysis takes a different perspective than typical social science research in that individuals are considered to be interdependent, rather than independent units. When individuals communicate with each other, information and resources can travel between them. In this way, certain individuals have access to better information because of their positions within the network, and social structure provides both opportunities and constraints for learning and facilitating change (Wasserman & Faust, 1994).

High social capital is linked to many desirable outcomes in education. Social network studies have examined the relationships amongst actors that facilitate or constrain the flow of a wide range of both physical and intellectual resources, including knowledge, materials, ideas, and practices (e.g., Coburn & Russell, 2008; Cole & Weinbaum, 2010; Daly, 2010; Frank, 2009; Levine & Marcus, 2010; Spillane, Hunt, & Healey, 2009). Other studies in education have found that schools organized as communities promote greater teacher commitment and more student engagement in schoolwork (Bryk & Driscoll, 1988; Rowan, 1990). Lee, Dedrick, and Smith (1991) examined the effect of the social organization of schools on teachers' efficacy and satisfaction and found that principal leadership, communal school organization, and teacher environmental control were associated with efficacy. Lee and Smith (1996) using nationally representative high school data found that the achievement gains in reading, mathematics, science, and history were significantly higher in schools where teachers reported that they took collective responsibility for learning. McLaughlin and Talbert (2001) found that professional communities in high schools influenced professional satisfaction and instructional practice.

Social network structures can focus on different units within an organization, including the individual, the subgroup, the entire organization, or even cross-organizational relationships. The most basic element in social network theory are 'ties' or connections between individuals as they interact. The pattern of ties in an organization creates the opportunities for resources to pass amongst individuals and across subgroups (Borgatti, Mehra, Brass, & Labianca, 2009).

Social network theorists consider the positions of individuals within a network to be an essential aspect of their influence. When describing influence, theorists focus more on the position of individuals relative to other actors as opposed to their formal title or position (Scott, 2000). An individual's influence in a social network is affected by the range and quality of ties that she/he has or is surrounded by. Influence can be explained by a range of factors, including expertise, formal authority, experience, access to resources, physical proximity, and social connections (Supovitz, 2008).

Coaches and administrators can also play useful roles in school social networks because they naturally connect across grade-level groupings and may have more professional interactions outside of their school (Young, 2006). These "boundary spanners" can broker resources in a way that individuals embedded in a constrained network cannot. However, a coach's ability to move information and strategies may be dependent on whether the coach has adequate social ties to diffuse resources throughout a system; absent those relationships, the expertise and knowledge of the coach may remain personal assets (Atteberry & Bryk, 2011).

Another key dimension of social network theory is the importance of social interactions within and amongst subgroups within a larger system. In schools, these may be grade-level teams in elementary schools, subject-matter teams in middle schools, or other sub-teams structures. Collaborating with colleagues is a form of knowledge generation that can both produce new understandings and help make tacit information and ideas explicit (Nonaka, 1994). Dense subgroup interactions help to disperse resources, support the transfer of information, facilitate collaborative problem solving, and help produce innovative solutions (Krackhardt, 1992; Reagans & McEvily, 2003; Uzzi, 1997). Developing a collaborative environment that provides for the sharing of ideas and strategies with colleagues (Forman, 2007; Young, 2006) is an important aspect of building capacity from within. Creating and supporting opportunities for subgroups to exchange resources has the potential to develop novel information that benefits not only the subgroup but also the larger system in which the cluster resides (Frank & Zhao, 2005).

Finally, access to resources outside of one's social network is another important attribute of social capital described in the literature (Lee, Lee, & Pennings, 2001). Connections and absorptions of external resources can bring new materials, ideas and strategies into an organization (Zaheer, Gulati, & Nohria, 2000; Lin, 2002). The use of intermediary organizations, such as the Children's First Networks in New York City, in developing capacity and infusing skills is another way of building social capital. In addition, technology creates further opportunities to access external knowledge and ideas.

Report Structure

The goal of this investigation is to understand how the presence and position of knowledge and influence about the Common Core State Standards (called the Common Core Learning Standards, or CCLS, in New York City) is arrayed inside of a sample of New York City schools. The CPRE research team conducted a mixed-method research study of a sample of eight New York City schools (five elementary and three middle schools) during the 2012-13 school year. The findings reported here come from a school-wide faculty survey conducted as part of the research.

After this introduction, we provide an overview of the context of Common Core implementation in New York City. Then, we provide a brief overview of our research design, including a description of the sample, survey approach, and analytic methods. Next, we describe the results of the survey, with a special emphasis on knowledge and communication by individuals and within and across teams. We also identify a small group of individuals in the sample who were particularly influential, examining differences in their knowledge, experience, and access to external Common Core resources. The final component of the results section models the predictors of knowledge and communication of individuals nested within teams. We conclude the report with a discussion of the results.

The Context of Common Core Implementation in New York City

New York City is far and away the largest school district in the United States, with over 1 million students and 1,700 schools, almost twice as large as the next largest district of Los Angeles. NYC is diverse ethnically, socially, economically, and culturally. New York also has a history of decentralization. School principals hire and evaluate their teachers. Schools can choose from amongst a wide-ranging list of district-approved curricula across the content areas. Additionally, school leaders confer with faculty to develop both individual- and school-level professional development opportunities.

Implementation of the Common Core Learning Standards (CCLS) has been a central part of reform in New York City since 2010, when district leaders decided to focus their instructional improvement efforts around the Common Core State Standards. These Standards are an ambitious set of learning expectations in literacy and mathematics that describe what students should know and be able to do as they progress throughout the grade levels (Grossman, Reyna, & Shipton, 2011). While these standards do not specify a curriculum or pedagogical strategies, they challenge teachers to rethink the ways in which they provide students with educational opportunities and foster the intellectual engagement of students. Each year since, the New York City Department of Education (NYCDOE) has created a set of focusing expectations for schools in order to guide their engagement with the Standards.

Each school in the city also belongs to a support network, called a Children First Network, or CFN. CFNs grew out of the NYDOE Empowerment Schools Initiative designed to synthesize operational and instructional support for schools. The goal is to devolve as much decision-making power as possible to the people who know schools best: principals, teachers, and school staff. Principals get to pick one of the 55 CFNs that best meet the needs of their schools; if they're not satisfied with their Network support, they can move to a different Network. Each CFN employs a cross-functional team directly accountable to principals and delivers personalized service to an average of about 25-30 schools. CFNs are non-geographic by design. Some networks are organized around a particular area of expertise or philosophy. Some CFNs serve mostly middle schools, and others serve schools in particular geographic areas of the city.

The district evaluates schools through a site visit quality review process. The Quality Reviews are a 2-3 day school visit to each New York City school. Before a reviewer visits a school, the school leadership creates a self-evaluation based on a Quality Review rubric. During the review, the external evaluator visits classrooms, talks with school leaders, and uses a rubric to evaluate how well the school is organized to support student achievement. Reviewers draw upon the school's self-evaluation and other school data during conversations they have with principals, teachers, students, and parents during the school visit. These reviews result in a set of ratings on a number of dimensions.

During the time period studied, the district was also developing a new teacher evaluation system focused on principal observations of instruction and feedback using the Danielson Framework for Teaching. The system includes more frequent observations of instruction and conversations between school leaders and teachers about each teacher's ongoing development and impact on student learning and ongoing professional development to support each teacher's growth.

Sample Selection

Using the sample of 16 schools from our 2011 report (Goldsworthy, Supovitz, & Riggan, 2011), we selected nine schools, three high engaging schools, three moderate engaging schools, and three low engaging schools. One school chose to withdraw after an initial set of interviews. The remaining eight schools participated in all aspects of the data collection for this report.

Demographic information for the eight participating schools is shown in Table 1. Five of the schools were elementary schools, while three were middle schools. The schools had a broad range in size, from a 160 student K-5 school to a 1,500 student middle school. Schools in the sample averaged about 40 percent proficiency in ELA and mathematics. Free/reduced lunch, a measure of school poverty, ranged from a high of almost 90 percent to a low of 27 percent, averaging 70 percent. Schools in the sample had, on average, 11 percent English language learners, and just less than 20 percent of the students were classified as special education. The schools also had a range of ethnic mix of their student population and all five boroughs of New York were represented in the sample.

Table 1: Demographics of Final School Sample 2012-2013.

School	Grade	Approx. Size	ELA Proficient %	Math Proficient %	Free & Reduced Lunch %	ELL %	SPED %	Black %	Hispanic %	White %	Borough
1	K - 5	1000	19	13	85	10	12	48	41	5	Bronx
2	PK - 5	950	14	27	89	20	11	9	58	4	Bronx
3	K - 5	600	24	36	69	14	16	26	52	16	Manhattan
4	PK - 5	400	36	41	89	9	13	26	61	3	Manhattan
5	K - 5	200	45	50	57	6	20	4	36	48	Staten Island
6	6 - 8	1550	35	36	89	20	14	1	50	3	Queens
7	6 - 8	950	61	70	51	5	13	5	10	19	Queens
8	6 - 8	500	61	64	27	1	19	23	17	48	Brooklyn
Avg.		769	37	42	70	11	15	18	41	18	

Research Design

The research design for this analysis was based on a school faculty survey. It was connected to a companion investigation of Common Core implementation in New York City. The overall study combined two rounds of school interviews along with the faculty survey. The school interviews at the schools took place on two separate occasions. The first round of interviews was conducted via telephone, mainly with school administrators, to learn about any changes from the previous school year regarding the school's approach to implementing the Common Core and how teams in the school were organized to implement the Standards. Following these initial interviews, we visited each school and administered a short faculty survey that was focused on Common Core knowledge and how the faculty interacted around understanding and implementing the CCLS. Finally, using data from our initial set of interviews at each school as well as data from the faculty survey, the research team selected a sample of administrators and staff in each of the eight schools and conducted a second round of interviews. These occurred during a one-day site visit by two researchers, who interviewed teachers and administrators identified on the survey as having high CCLS knowledge and influence with their colleagues about CCLS implementation. The companion report on teacher collaboration focuses more heavily on the interview data.

The component of the research reported here addresses three central research questions:

1. How were knowledge and influence about the CCLS distributed across the sample of school faculty members?

2. Who were the knowledgeable and influential individuals about the CCLS in schools and what positions did they hold?

3. What is the relationship between CCLS knowledge and influence and what individual and grade-level characteristics are associated with them?

Knowledge and Communication Survey

In the spring of 2013, the staff at the eight schools in our sample (five elementary schools and three middle schools) completed a survey to understand the combination of knowledge and communication that facilitate CCLS implementation. The survey gathered information on faculty knowledge and interactions around the CCLS both inside and outside of their school. The survey was completed during a faculty meeting attended by a CPRE research team member, who explained research purposes and confidentiality of the survey. Across the eight schools surveyed, 456 out of 524 faculty members completed the survey, for 89 percent response rate. School response rates ranged from 74-100 percent (See Appendix A).

The two-page survey was comprised of four parts: 1) job demographics, 2) professional communications, 3) knowledge of the CCLS, and 4) use of external resources. The job demographics section asked respondents to identify their current role in the school, what subjects and grades the respondents taught (if applicable), and their years of experience. The second section of the survey listed social network questions that asked respondents who they turned to for answers to questions about: a) the Common Core, and b) implementing performance assessments (a central component of the NYC instructional expectations for teachers). Respondents were first asked to identify up to five staff members that they turned to for advice on each topic, how often they sought guidance from that individual, and how influential was the advice. The third section of the survey asked respondents six Common Core knowledge questions, three about ELA and three about mathematics. The fourth part of the survey listed 10 external sources of Common Core information and asked respondents which of the sources they used for Common Core planning and implementation. A copy of the survey is shown in Appendix B.

Survey Analysis Method

We focused our analysis on individuals and grade-level (elementary school) and subject-matter (middle school) teams, and not the school as a whole. Our rationale for this was both substantive and methodological. Substantively, the focus of CCLS implementation in New York was to engage with the Standards as teams. Methodologically, our sample of eight schools was too small to conduct statistical analyses at the school level.

The survey components about CCLS knowledge and influence were first analyzed separately, and then combined to address the central research questions. The two professional communications questions provided us with social network data on two school advice networks, one for advice about the Common Core and the second for advice about performance assessments. To analyze these data, we first entered these survey data into matrices, one for each network. Second, using UCINET software we produced sociograms for each school and each network (see Figure 1 below). These descriptive pictures allowed us to gain a sense of how knowledge and communication were arrayed in each school and who were the sources of knowledge for each network.

To examine the extent of communication happening within teams in both the elementary and middle schools, we considered the density, frequency, and influence of within-team ties for each of the 38 teacher teams. The density score is the within-team number of actualized advice-seeking ties (i.e. in-ties) as a proportion of the number of potential ties amongst the team members. Thus, a three-person team would have six potential ties, which would serve as the denominator in a ratio of the actual ties as a proportion of the possible ties. The higher a team's density score, the greater proportion of a team's members reported going to each other for information or advice about the particular topic of the network (either CCLS or performance assessments). In addition to density scores, we also report measures of the average frequency that teachers went to others on their team for advice (on a 1-4 scale ranging from a few times a year to daily or almost daily) and how influential the information was (also on a 1-4 scale, ranging from not influential to highly influential). See Appendix B for the survey instrument.

To produce measures of individual-level knowledge in ELA and mathematics, we aggregated three survey knowledge questions into a three-point scale in each domain. One of the items in each subject area allowed for partial credit. The external assistance data were also analyzed individually and an aggregated scale was produced that ranged between 0 and 10.

These data from the social network survey items, the mathematics and ELA knowledge scales, the external assistance data, and the job demographics were combined into an individual-level dataset. Next, we aggregated the individual-level data to produce a team-level dataset (grade-level teams in the elementary schools and subject-matter teams in the middle schools). These data were used to examine both the levels and variation in knowledge and communication across teams both within and across schools.

To identify individuals who were highly influential, we compared the strength of each teacher to their expected strength based on a technique developed by Cole and Weiss (2009). The expected strength of a teacher is determined based on the observed structure of out-ties and the pattern of influence across network ties. We calculated each person's expected number of in-ties based on a random distribution of influence, given the composition and density of the network. Assuming that each teacher had an equal probability of being identified in the actual pattern of out-ties (i.e. teachers were selected at random within a fixed network structure), we calculated the expected influence of a teacher in each network and the associated standard error of the mean. This was used to empirically test for highly influential teachers. An inferential test was then used to determine if the observed influence was statistically significantly greater than the expected influence. By doing this, influential individuals were those whose influence is statistically significantly greater than random chance while holding constant the number, frequency, and influence of conversations in the network.

Finally, to address the last research question, we developed two sets of multi-level models that appropriately nested teachers within teams. The first pair of models predicted communication (separately in the Common Core and Performance Assessment networks) as a function of Common Core knowledge, experience, position (administrator, teacher, coach) and external outreach. The second pair of models predicted Common Core knowledge (separately for mathematics and ELA) as a function of position and external outreach. This was important to include because we did not want to unduly privilege faculty members in large schools for having greater communication opportunities.

Picturing how Knowledge and Communication are Arrayed in Schools

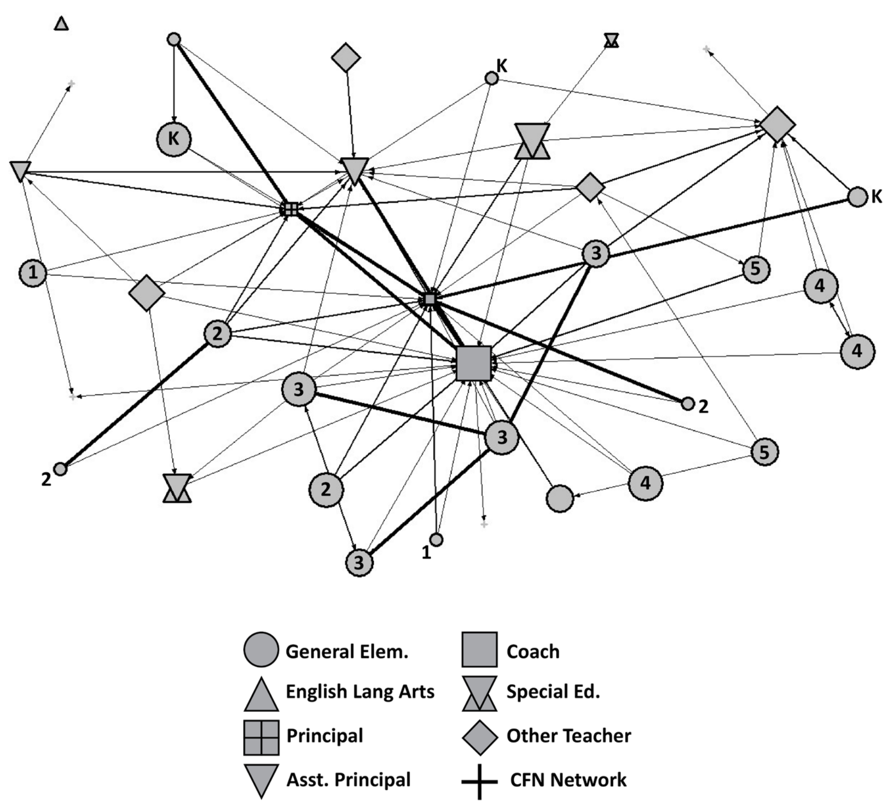
Social network analysis is a useful technique to help us picture how knowledge and influence are distributed in schools. The picture below (Figure 1) depicts the ELA Common Core network in an elementary school. The picture is intended to give you a visual representation of the ELA Common Core network. In the picture, each individual within the school is represented by a shape, or node. The position of each individual is captured by the shape of the node, where general elementary teachers are circles, as shown in the key below the figure. The grade of the teacher is placed in the center, or next to, each circle, allowing us to distinguish which teachers are at the same grade level. The lines that connect each individual, or node, show the requester and recipient for information about the Common Core. These lines are called ties, because they connect people to others. Each tie has an arrow on one or both ends, which shows which individual was the requestor and which was the recipient for information about the Common Core. The thickness of the ties represents a combination of both the frequency of requests for information and the perceived influence of the recipient. Finally, the size of the node represents the amount of knowledge that the individual has about the Common Core, as measured on our five-item

Common Core knowledge test. You will notice a few individuals (like the person below the triangle in the top left of the graph) appear to have no size. These people did not complete the survey, and therefore they have no Common Core knowledge score. They were, however, mentioned as a recipient for assistance (hence the out-tie from the assistant principal below them).

Pictures like this help to give us a visual representation of the data and to show a kind of x-ray of the array of knowledge and influence in schools. From this picture, for example, we can see that the 3rd-grade team has three fairly knowledgeable members, with the fourth member both less knowledgeable and less connected to the rest of the team. By contrast, we can see that the 4th-grade team has both fewer and weaker ties.

From the picture we can also see that two coaches (in the center of the picture) are both strong and the central recipients for information in their school (as shown by both the number of ties they receive and the thickness of those ties), and are both knowledgeable about the ELA CCLS (as shown by their node size). One of the coaches, in particular, has strong knowledge about the ELA Common Core, as indicated by the large size of the node.

Figure 1. ELA Common Core Knowledge and Communication Patterns in One Elementary School.



While these pictures are wonderful depictions of how knowledge and influence are arrayed in schools, their downside is that they are fairly inefficient ways of representing the data about knowledge and influence within schools. For example, we can 'eyeball' the relative connectedness and dispersion of teams, but we cannot really compare teams within the school, much less across schools. While staff in the building did seek out the principal for advice regarding Common Core, the principal received less in-ties than either of the coaches. The principal also has less knowledge about the ELA Common Core than at least one of the coaches. Therefore, in the rest of this paper we are going to represent numerically the characteristics shown in Figure 1 – including nodes, node size, ties, and ties strength.

The results section is organized to address the three central research questions of this investigation.

1. How were knowledge and influence about the CCLS distributed across the sample of school faculty members?

2. Who were the knowledgeable and influential individuals about the CCLS in schools and what positions did they hold?

3. What is the relationship between CCLS knowledge and influence and what individual- and grade-level characteristics are associated with them?

Across the eight schools, our survey sample consisted of 456 respondents. Across the eight schools surveyed, 456 out of 524 faculty members completed the survey, for an 89 percent response rate. School response rates ranged from 74-100 percent (See Appendix A). Tables 2 and 3 provide descriptive information about the knowledge, influence, and external resource access of the faculty members in the elementary (Table 2) and middle (Table 3) schools. Focusing first on the elementary schools in Table 2, we can see that administrators (principals and assistant principals) were the most knowledgeable about the CCLS in both ELA and mathematics. Post hoc tests indicated, however, that the teacher, coach, and administrator means were not significantly different in either ELA or mathematics, but that all three means were higher than the faculty in the 'other' category (a hodge-podge of other positions, including counselors, librarians, speech teachers, etc.).

The next two columns in Table 2 show the average and standard deviation of the in-ties in the two networks, assistance giving about the CCLS and performance assessments. These two networks were chosen to represent advice networks on the two major topics related to Common Core implementation in the district. The elementary school administrators and coaches were the major recipients of requests for information about the Common Core and performance assessments. In the CCLS network, there was no significant difference between the average requests of coaches (13.11) and administrators (12.12), while administrators received significantly more requests for advice about the performance assessments (11.06) than did coaches (8.44) (mean diff. 2.68, s.e. 1.045, p=.013). Teachers received far fewer requests for assistance on either topic, on average only about 1.5 requests for assistance. The range for teachers was large, however, between 0-16 requests about the CCLS and 0-10 about performance assessments. The dramatic difference between coach/administrators and teachers can be explained by a number of factors including the large number of teachers (177), the fact that about 40 percent received no requests for information about either topic, and the lesser availability of teachers during the school day.

Table 2. Descriptive Statistics for Common Core Knowledge and Influence in Elementary Schools

		Knowledge		Influence		
	Sample	ELA Knowledge Test (Mean & SD)	Math Knowledge Test (Mean & SD)	CCLS Network In-Ties (Mean & SD)	Performance Assessment Network In-Ties (Mean & SD)	External Sources (Mean & SD)
Classroom Teachers	177	1.7 (.81)	153 (.87)	1.42 (2.13	1.49 (1.90)	4.37 (2.71)
Coaches	9	1.82 (.91)	1.64 (7.80)	13.11 (7.80)	8.44 (7.04)	6.22 (2.39)
Administrators	16	2.19 (.72)	1.81 (.92)	12.12 (6.80)	11.06 (5.04)	6.50 (1.97)
Other	39	1.17 (1.06)	.93 (.95)	.67 (1.16)	.77 (1.40)	2.46 (2.72)
All	241	1.65 (.88)	1.45 (.92)	2.44 (4.50)	2.27 (3.69)	4.27 (2.83)

The middle school data, shown in Table 3, is organized slightly differently. First, teachers are broken into their subject-matter specialties (ELA, mathematics, science, and social studies). Second, nobody reported they were a middle school coach, so there is no coach designation in the middle schools.

Table 3. Descriptive Statistics for Common Core Knowledge and Influence in Middle Schools

		Knowledge		Influence		
	Sample	ELA Knowl-edge Test (Mean & SD)	Math Knowl-edge Test (Mean & SD)	CCLS Network In-Ties (Mean & SD)	Performance Assessment Network In-Ties (Mean & SD)	External Sources (Mean & SD)
ELA Teachers	39	1.98 (.65)	.16 (.43)	2.32 (1.40)	2.26 (1.31)	3.54 (2.33)
Math Teachers	46	.60 (.76)	1.76 (.79)	2.95 (2.26)	2.81 (1.75)	2.39 (1.99)
Science Teachers	28	1.55 (1.10)	.50 (.71)	2.28 (1.74)	2.35 (1.72)	2.25 (2.29)
Social Studies Teachers	24	1.54 (.83)	.18 (.36)	2.83 (2.33)	1.93 (1.39)	2.50 (2.34)
Administrators	12	2.35 (.53)	1.32 (1.04)	18.08 (9.70)	14.00 (8.99)	4.75 (2.01)
Other	66	1.06 (1.17)	.41 (.65)	1.50 (.92)	1.31 (.64)	2.23 (2.22)
All	215	1.32 (1.07)	.69 (.90)	3.65 (5.36)	3.08 (4.22)	2.67 (2.29)

The patterns in middle schools are fairly representative to subject-matter expertise. The ELA teachers had significantly higher ELA knowledge (an average of 1.98 on the three-point scale) than did the other subject-matter teachers; but their ELA knowledge was not statistically different than the administrators average score of 2.35 (mean diff. .37, s.e. .31, p=.238). The mathematics teachers, with an average of 1.76 on the three-point scale, performed significantly higher than all other groups, including administrators (mean diff. .44, s.e. .21, p=.042).

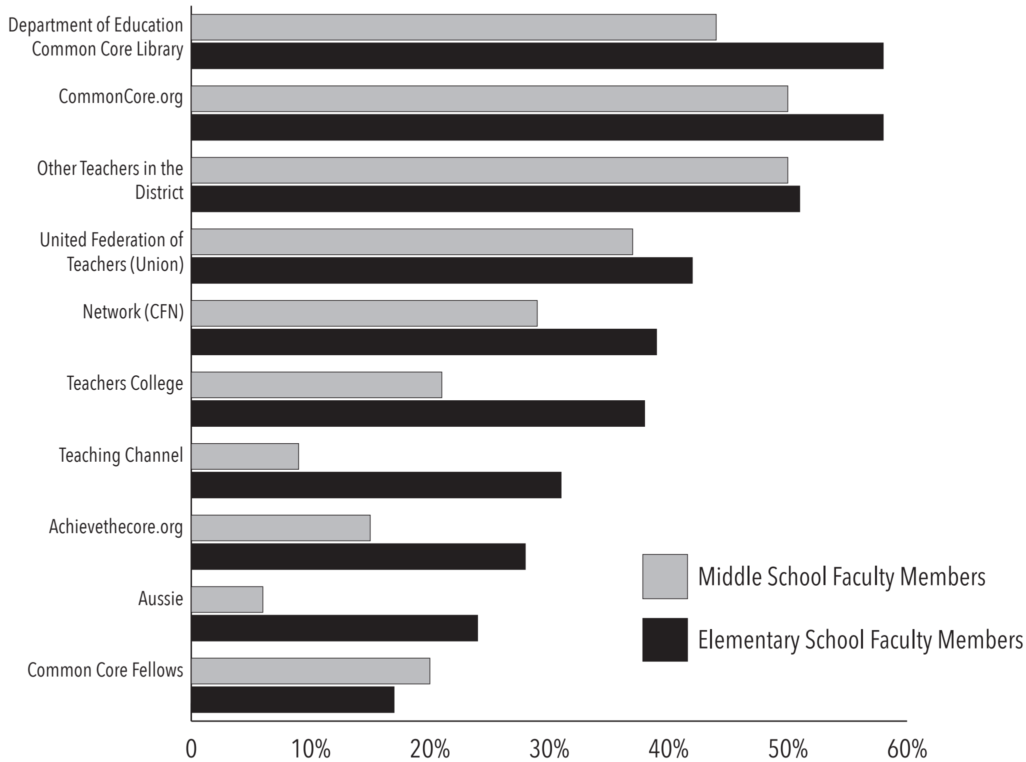
In terms of seeking assistance for both implementing the Common Core and administering performance assessments, administrators were far greater recipients of requests for assistance, garnering an average of 18 requests for CCLS assistance and an average of 14 requests for assistance about performance assessments. By contrast, teachers received an average of about 2-3 requests for assistance on these topics.

The final column in Tables 2 and 3 shows an aggregate of 10 types of external resources that faculty members were asked about accessing. Before discussing these aggregate numbers, permit us to digress to talk about the individual resources that we aggregated into Tables 2 and 3.

The 10 individual external resources that we asked about on the survey are shown in Figure 2, broken down by the percent of elementary and middle school faculty who reported accessing each external resource. In elementary schools, the most frequently accessed resources were the Common Core website (CommonCore.org), and other teachers in the district. Less frequently accessed resources for elementary school faculty were the teaching channel and Aussie, an external support provider who offered resources and professional development to schools in the district.

In middle schools, faculty members most frequently reported going to the district's Common Core library and to CommonCore.org. Less frequently used resources were Aussie and the district's support members, called the Common Core Fellows. Even though they were less frequently used, these external supports were still accessed by about one in five middle school faculty member. Finally, it should be noted that we only included this list on our survey, with a chance for respondents to write in other resources they used. Other commonly mentioned resources that were mentioned were ARIS, the district's on-line data system, and EngageNY.org, the New York State website.

Figure 2. External Resources Accessed by Elementary and Middle School Faculty



Returning to Tables 2 and 3, the last columns of each table show the aggregated external resources that elementary and middle school faculty reported accessing. On average, the elementary faculty member respondents reported going to an average of 4.27 of the external sources, with a standard deviation of 2.83. There were no statistical differences between the external outreach of coaches and administrators (mean diff. .28, s.e. 1.11, p=.80), but both coaches (mean diff. 1.85, s.e. .91, p=.043) and administrators mean diff. 2.13, s.e. .69, p=.002) sought out significantly more external sources than did teachers.

The extent of outreach to external resources was slightly less in the middle schools (mean = 2.67) than those reported in the elementary schools (mean = 3.89). The within middle schools patterns, however, were similar, with administrators having significantly higher outreach than all groups except ELA teachers (mean diff. .44, s.e. .21, p=.042). ELA teachers also had significantly more outreach than did mathematics teachers (mean diff. 1.15, s.e. .48, p=.018).

Between Team Common Core Knowledge and Communication

Our next analysis focused on the 38 teacher teams across the 8 schools in the sample. While a variety of group configurations are used within schools (grade-level teams, subject-matter teams, inquiry teams, special project teams, etc.), we focused on the team structures that are used most frequently by teachers. In the elementary schools we focused our analyses on grade-level teams and in the middle schools we focused on content-area teams. In all, there were 26 elementary grade-level teams and 12 middle school content area teams across the 8 schools in our sample. One small elementary school had only two teams: a team of kindergarten through 2nd-grade teachers, and a team of 3rd- through 5th-grade teachers. The other four elementary schools had six teams each (one per grade in Grades K-5). The number of team members for the elementary school grade-level teams ranged from the smallest teams having only 2 team members and the largest team having 11 team members. In the middle schools, four content area teams for each of the three schools were analyzed: mathematics, ELA, social studies, and science. The number of team members across these 12 teams ranged from a low of 5 team members to a high of 24 team members in the largest middle school in our sample.[1]

Common Core Knowledge

Teachers were asked a series of knowledge questions designed to assess their familiarity with the content of the Common Core standards. Three questions were focused on the ELA standards, and three focused on the mathematics standards. Respondents were then assigned a separate score for ELA and mathematics based on their cumulative correct responses, out of a potential three points. For one question in each content area, respondents were able to earn partial credit. See Appendix B for the actual knowledge questions on the survey.

The team average results on the ELA and mathematics test items for elementary and middle school team members are shown in Tables 4 and 5, respectively. The rows in the tables represent teams, while the columns represent knowledge and communication averages for four variables. The first two variables are the average scores for the ELA and mathematics knowledge tests, which are on a scale of 1-3. The next set of columns show the density, frequency and influence scores for two communications networks. The first communication network is conversation about the CCLS. The second communication network is conversation about performance assessments, which is a key component of Common Core implementation in New York City (see Supovitz, 2013).

Each of the two communications networks (CCLS and performance assessments) is represented by three variables: density, frequency and influence. The density score is the within-team number of actualized advice-seeking ties amongst team members as a proportion of the number of potential ties amongst the team members. The higher a team's density score, the greater proportion of a team's members reported going to each other for information or advice about the particular topic of the network (either CCLS or performance assessments). In addition to density scores, we also report measures of the average frequency that teachers went to others on their team for advice (on a 1-4 scale) and how influential (again on a 1-4 scale) they felt the advice was that they received.

Finally, for each of the knowledge and communication measures, we calculated the overall mean and standard deviation, and then determined which team averages for each measure were a half a standard deviation above average and a half a standard deviation below average. These are shaded as a way of eyeballing which teams had relatively high and relatively low scores on each measure.

1 This middle school had 24 mathematics teachers and 23 English teachers. Even though it is unlikely that all the subject-specific teachers met as a single team, we are treating them as a subject-matter team for the purposes of this analysis.

Table 4. Elementary School Grade-Level Teams Common Core Knowledge and Communication

			Knowledge Average		CCLS Communication			Performance Assessment Communication		
School	Grade	Team Size	ELA	Math	Density	Frequency	Influence	Density	Frequency	Influence
2	4	7	2.30	1.77	0.21	2.78	3.33	0.31	2.46	3.46
4	3	4	2.15	2.45	0.42	3.40	3.80	0.33	2.25	4.00
1	3	9	2.10	1.35	0.11	2.88	3.75	0.14	2.30	3.70
2	5	8	2.08	2.03	0.16	2.22	3.33	0.18	2.30	3.20
1	4	8	2.05	1.65	0.29	1.75	2.69	0.21	1.58	2.67
5	3-5	5	2.00	1.96	0.10	4.00	4.00	0.20	3.00	3.50
2	1	8	1.98	1.28	0.10	1.88	3.38	0.20	1.91	3.36
3	2	6	1.97	1.23	0.23	2.43	2.86	0.30	1.67	2.44
3	1	4	1.93	1.67	0.50	2.83	3.17	0.33	3.25	3.25
2	2	7	1.91	1.37	0.05	1.50	4.00	0.02	2.00	4.00
3	3	6	1.90	2.23	0.37	2.91	3.55	0.53	2.69	3.50
2	3	6	1.87	1.83	0.30	2.56	3.89	0.20	3.17	4.00
3	5	11	1.82	1.84	0.13	3.00	3.71	0.15	2.59	3.71
4	2	4	1.70	1.45	0.17	3.00	3.50	0.17	2.00	3.50
3	5	7	1.66	1.74	0.24	2.60	4.00	0.24	2.30	4.00
4	4	3	1.53	2.73	0.33	3.00	3.00	0.33	3.00	3.00
2	K	8	1.53	0.83	0.14	2.63	3.63	0.10	2.75	3.25
3	4	8	1.53	1.75	0.27	3.13	3.73	0.29	2.38	3.81
5	K-2	5	1.36	1.36	0.00	0.00	0.00	0.15	3.33	3.67
1	1	7	1.33	0.97	0.05	2.00	4.00	0.05	1.50	4.00
3	K	4	1.30	1.70	0.08	4.00	2.00	0.33	2.00	2.25
4	1	2	1.30	1.10	0.00	0.00	0.00	0.00	0.00	0.00
4	5	2	1.30	2.00	0.00	0.00	0.00	0.00	0.00	0.00
1	K	9	1.22	1.73	0.19	3.21	3.79	0.25	3.00	3.72
4	K	3	1.20	1.33	0.00	0.00	0.00	0.33	4.00	4.00
1	2	7	0.94	1.34	0.14	2.50	3.67	0.10	2.50	3.50
	Mean	6.08	1.69	1.64	0.18	2.32	2.95	0.21	2.30	3.21
	SD	2.33	0.36	0.44	0.14	1.16	1.36	0.13	0.90	1.06
		> .5 SD	1.87	1.86	0.24	2.90	3.63	0.27	2.75	3.74
		< .5 SD	1.51	1.42	0.11	1.73	2.27	0.15	1.86	2.68

Table 4 shows the overall team averages for ELA and mathematics knowledge amongst the elementary grade-level teams. The average ELA score was 1.69, with a standard deviation of .36. In mathematics, the average score was 1.64, with a standard deviation of .44. Eleven of the 26 elementary school-grade level teams (42 percent) had average ELA knowledge scores more than a half a standard deviation above average. Additionally, the six most knowledgeable teams were upper elementary grade level (3-5) teams. On the other hand, 8 of the 26 teams had average ELA knowledge scores (31 percent) below a half a standard deviation below the average, and all but one were lower elementary (K-2) teams.

The average scores in mathematics reflected a different pattern. While the mean was similar, the standard deviation was wider. Consequently, only 5 of the 26 teams (19 percent) had average scores of greater than a half a standard deviation. By contrast, 10 of the teams (or 38 percent) had average scores below a half a standard deviation below average. Additionally, only 4 of the 26 teams (15 percent) were above a half a standard deviation in both ELA and mathematics. Five of the teams were below a half a standard deviation below average in both subjects.

Unsurprisingly, there were starker contrasts amongst the middle school content-area teams both within and between their average ELA and mathematics scores. The middle school knowledge scores, organized by subject-matter teams, are shown in the first few columns of Table 5. In ELA, the average knowledge score on our three-point scale was 1.51. Six of the 12 middle school subject-matter teams (50 percent) had ELA scores higher than a half a standard deviation above average (shown in black). These included the three ELA teams, and also two science and one social studies team. By contrast, four of the 12 teams (33 percent) had scores below a half a standard deviation below average. The three mathematics teams had the lowest ELA knowledge scores.

Table 5. Middle School Subject-Matter Teams Common Core Knowledge and Communication

			Knowledge Average		CCLS Communication			Performance Assessment Communication		
School	Subject	Team Size	ELA	Math	Density	Frequency	Influence	Density	Frequency	Influence
6	ELA	23	2.02	0.21	0.07	2.94	3.53	0.07	2.54	3.49
7	ELA	10	2.00	0.12	0.10	2.44	3.00	0.09	2.33	2.92
7	SCI	5	2.00	0.68	0.20	2.50	3.00	0.35	2.14	2.86
8	SS	6	1.97	0.10	0.23	1.86	2.71	0.23	1.57	3.29
8	SCI	9	1.93	0.49	0.17	1.92	2.83	0.15	2.18	2.82
8	ELA	13	1.89	0.06	0.08	3.00	3.00	0.11	2.24	3.29
7	SS	7	1.56	0.04	0.12	2.20	3.00	0.14	2.00	3.17
6	SS	11	1.55	0.18	0.05	2.60	3.60	0.05	2.83	3.50
6	SCI	17	1.18	0.64	0.07	2.16	3.32	0.10	2.21	3.29
8	MATH	15	1.00	1.89	0.21	2.91	3.18	0.23	2.83	3.23
7	MATH	8	0.63	1.26	0.27	3.40	3.47	0.21	2.58	3.25
6	MATH	24	0.39	1.79	0.08	2.30	3.10	0.06	2.37	3.14
	Mean	12.33	1.51	0.62	0.14	2.52	3.14	0.15	2.32	3.19
	SD	6.31	0.58	0.67	0.08	0.47	0.28	0.09	0.35	0.22
		> .5 SD	1.80	0.96	0.18	2.75	3.28	0.20	2.50	3.30
		< .5 SD	1.22	0.29	0.10	2.28	3.00	0.10	2.14	3.08

The mathematics performance, on average, was substantially lower in mathematics than it was in ELA. The average score on the three-point scale in mathematics was only .62, with a standard deviation of .67. The lower average score in mathematics can be attributed to the low performance of three quarters of the teams; basically all the non-mathematics teams.

In terms of order of performance, the pattern in mathematics was almost symmetrically reversed for mathematics Common Core knowledge. The three mathematics teams had the highest scores amongst the 12 teams, while those with the lowest mathematics scores were the ELA, science, and social studies teams that performed well on the ELA Common Core knowledge test.

Communication about the Common Core and Performance Assessments

To examine the extent of Common Core-related communication happening within teams in both the elementary and middle schools, we considered the density, frequency, and influence of within-team ties for each of the 38 teacher teams. The density score is the within-team number of actualized ties (i.e. in-ties) as a proportion of the number of potential ties amongst the team members. Thus, a three-person team would have six potential ties, which would serve as the denominator in a ratio of the actual ties as a proportion of the possible ties. The higher a team's density score, the greater proportion of a team member's reported going to each other for information or advice about the particular topic of the network (either CCLS or performance assessments). In addition to density scores, we also report measures of the average frequency that teachers went to others on their team for advice (on a 1-4 scale, ranging from a few times a year to daily or almost daily) and how influential the information was (also on a 1-4 scale, ranging from not influential to highly influential). See Appendix B for the survey instrument.

The density, frequency, and influence scores for the two networks we examined (CCLS and performance assessments) are shown in the latter parts of Tables 4 and 5. For communication about the CCLS within the 26 elementary school grade-level teams, the overall average density was 0.18, while the density for communication about performance assessment was .21. This means, on average, about 20 percent of all potential ties between team members were actualized. In the CCLS network, seven of the elementary school grade-level teams had a density above 0.24, and six of those teams were either 3rd- or 4th-grade teams. (The exception was a four-team member 1st-grade team with a density of 0.5, the highest density of any team.) At the other end of the spectrum, nine teams had a density below 0.11, including four teams with a density of 0. These nine teams were fairly equally distributed across the grade levels, with no discernable pattern by grade.

The average frequency of communication about the CCLS was 2.32, which means that, of the communication that did occur, it occurred about monthly; while the influence average of 2.90 (on a four-point scale) indicates that respondents felt that the communication that occurred was influential. Contrasting the elementary school teams' communication on the CCLS with communications on performance assessments, we see that the latter communication occurred at a similar average frequency (2.30), but that those that did seek information on performance assessments felt it was more influential (3.21 on the four-point influence scale). The other thing notable by looking at Table 4 is that very few of the elementary school grade-level teams had strong knowledge in mathematics and ELA as well as strong communication about both the CCLS and performance assessments. While there were a few exceptions (the 3rd-grade teams in Schools 3 and 4, for example), most teams showed variability across the knowledge and communication measures. On the low end, there were a few teams, notably the 1st- and 5th-grade teams in School 4, who were greater than a half a standard deviation below average on all or almost all the indicators of knowledge and communication.

The variation, even within teams, between density and frequency/influence raises another key point: teams could have average or below average density of communication – which means that only a subset of the team is talking together about the CCLS and/or performance assessment – but those conversations they were having could be both frequent and influential. An example of this is the Grades 3-5 team in School 5, which only had two enacted ties out of 20 (or 10 percent of the possible ties between the five members) reporting seeking information about the Common Core from another team member. But that communication was reported to be both frequent, and highly influential. This raises interesting questions about the reasons for the paucity of communication on this team.

The density of communication in the middle schools was slightly weaker in both topics (CCLS and performance assessments) than in the elementary schools; with about 15 percent of the potential ties actualized (as compared to 20 percent in the elementary schools grade-level teams). Interestingly–as can be seen by comparing the average frequency and influence measures between elementary school and middle school teams–those ties that were actualized produced more frequent (2.52 compared to 2.32) and more influential (3.14 compared to 2.95) communication about the CCLS in the middle schools as compared to the elementary schools. By contrast, the frequency and influence of the actualized communication about performance assessments was very similar in the middle schools as compared to the elementary schools.

Another notable point from Tables 4 and 5 is the variation *within teams* in both Common Core knowledge and Common Core communication and across these indicators. This can be seen by looking across the rows in Tables 4 and 5, which show that teams are rarely either consistently above average or below average across the different indicators of knowledge and communication. This within-team variation is expressed in the correlation matrix in Table 6. The matrix is broken into two parts; with the top part (above the diagonal) representing the correlations for elementary schools and the bottom part (below the diagonal) showing the correlations between the indicators for the middle schools.

In the 26 elementary school grade-level teams, the correlation between ELA Common Core knowledge and mathematics Common Core knowledge was only .28; indicating only a small relationship between Common Core knowledge in one subject and knowledge in the other subject. Similarly, the correlation between the level of elementary school teams' knowledge about the Common Core, in either ELA or mathematics, is only moderately correlated (at about .5) with the density of their communication about either the Common Core or performance assessments. The strongest correlation in elementary schools is between the density of teams' communication about the Common Core and the density of their communication about performance assessments.

Table 6. Correlations between Knowledge and Communication Indicators in both Elementary and Middle Schools

	ELA Common Core Knowledge	Math Common Core Knowledge	CCLS Communication Density	Performance Assessment Communication Density
ELA Common Core Knowledge		0.28	0.46	0.29
Math Common Core Knowledge	-0.82		0.54	0.53
CCLS Communication Density	-0.12	0.35		0.66
Performance Assessment Communication Density	0.11	0.22	0.84	

Elementary School Correlation

Middle School Correlation

The area below the diagonal line in Table 6 shows the correlations between team-level indicators of knowledge and communication in middle schools. Given subject-matter expertise, it is not surprising that team-level knowledge of ELA and mathematics are strongly negatively correlated (-.82). This shows that teams with strong ELA knowledge have weak mathematics knowledge, and vice versa. The correlation in middle school between ELA Common Core knowledge and communication about either the Common Core or performance assessments is very small. This may be driven by the subject matter nature of conversations amongst middle school teams, but also suggest that ELA Common Core knowledge is not a topic of Common Core communications in middle schools. There is a slightly stronger correlation between team-level mathematics Common Core knowledge and team Common Core communication density (.35), which indicates that teams with stronger mathematics knowledge tend to have more Common Core-related conversations. This connection between subject matter Common Core knowledge and within-team Common Core conversations is also more present in mathematics than in ELA. In the final section of the report, we will look for further relationships amongst these indicators of knowledge and communication. Before those analyses, however, we focus on the particularly influential individuals in the elementary and middle schools.

Highly Influential Individuals in Schools

Opportunities for group collaboration are important mechanisms in schools for knowledge sharing. Colleagues can work and explore together to generate new knowledge to inform and improve their practice. In addition to collaborative knowledge creation and sharing, there are also particular individuals within each school that act as strong resources and brokers of knowledge. These individuals may hold formal leadership positions, such as the principal, a lead teacher, or coach, or they may be a teacher or other staff member whom the school faculty has come to rely on for helping them to gain an understanding about new initiatives or teaching approaches. High levels of influence can be associated with a number of factors. Supovitz (2008) conducted a study of influence in a national sample of high schools and found that teachers attributed influence to expertise, experience, access to resources, physical proximity, and formal authority. In virtually all cases, the influential individual also welcomed sharing their resources with others.

NYC's strategy of advocating knowledge sharing about the CCLS within schools assumes that there are individuals located within schools who have, or have access to, knowledge and resources that can help inform other staff in the school about the work of understanding and implementing the CCLS. In the following section, we describe the individuals who were statistically significantly more influential than others in the sample. We call these highly influential individuals 'influentials'. For a more detailed description of the statistical approach used to identify the influentials, see the survey analysis method section in this report.

Description of Influentials

Across the 8 schools in our sample, 23 influentials were identified for CCLS assistance, and 33 influentials were identified for performance assessment assistance. Eighteen of these individuals were identified as being influential for assistance on both topics. There were therefore, 37 unique individuals identified as being influential for at least one of the two topics, representing about 7 percent of the total survey sample.

Roles. Administrators were identified as influentials more often than were either coaches or classroom teachers for providing information about both the CCLS and performance assessments. The breakdowns of influentials by role for each of the two networks (CCLS and performance assessment) are shown in Figures 3 and 4. The reliance on administrators was slightly stronger in the CCLS network where 13 of the 23 (57 percent) influentials identified were administrators. This was true for both the elementary schools as well as the middle schools (8 of 14 influentials in the elementary schools were administrators, whereas 4 of 9 influentials in the middle schools were administrators). Comparatively, 14 of the 33 (42 percent) performance assessment influentials were administrators, including 7 of 17 in the elementary schools, and 7 of 16 in the middle schools.

Figure 3. Influentials across schools for CCLS

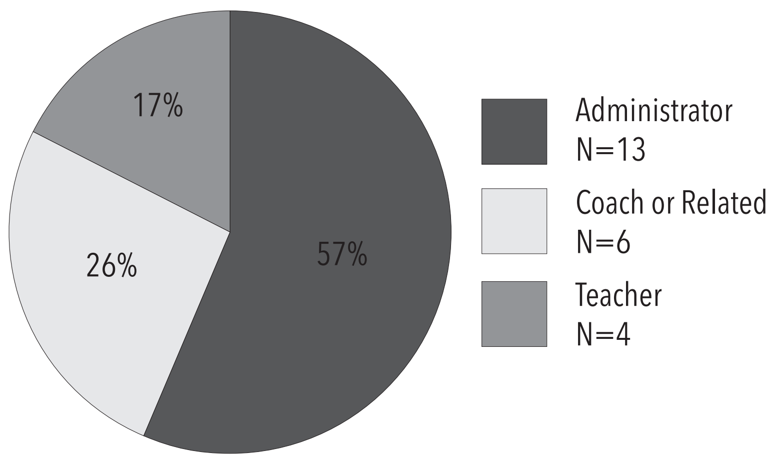
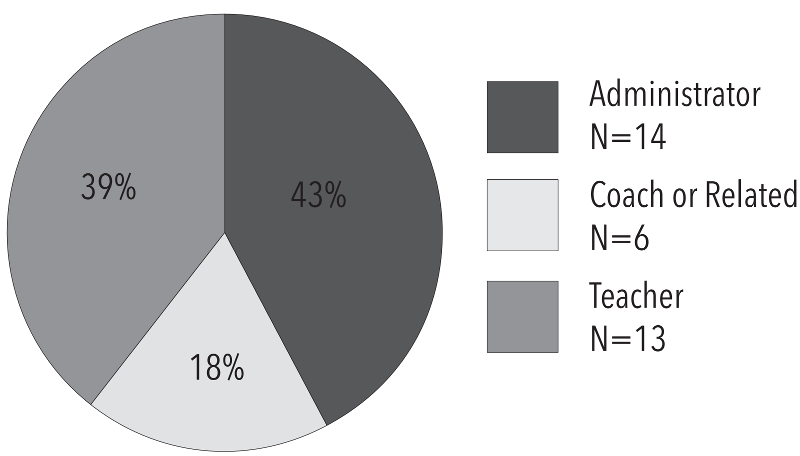


Figure 4. Influentials across schools for PBA



Teachers identified as influentials were relied on more frequently for advice about performance assessments than for general CCLS advice. Teachers accounted for 13 of the 33 (39 percent) performance assessment influentials, while accounting for only 4 of the 23 (17 percent) influentials for CCLS. Of those 4, only 1 was an ES teacher. Respondents, however, relied more heavily on coaches for general CCLS knowledge than for advice about performance assessment. Seven of the 23 influentials in CCLS were coaches, while only 6 of the 33 performance assessment influentials were coaches.

The heavier reliance on teachers for performance assessment and administrators and coaches for CCLS may be explained by the nature of these two types of knowledge. CCLS knowledge is a rather broad set of knowledge which could incorporate general knowledge of the CCLS, approaches to aligning curriculum, expectations around assessments, etc. It makes sense that this type of knowledge around "what's happening with the Common Core" would be more likely to come from administrators and coaches who are more likely to be privy of guidance offered by the district and are likely to have more access to their network and to other opportunities for professional development. Performance-based assessments (PBA), meanwhile imply a more concrete task for teachers. That is, designing, administering, and evaluating an assessment that can adequately gauge a student's progress in meeting the expectations of the CCLS. For this type of task, teachers seemed to be more likely to go to other teachers for advice as other teachers are actually engaged in the task of learning about PBA and they themselves have to think through the complexities and process inherent in PBA. Administrators and coaches, on the other hand, may be able to offer ideas and suggestions, but because they themselves do not have a classroom of students to consider are not as engaged in this work as teachers themselves.

Comparing the Influentials to Other Faculty Members

We also compared the individuals who were identified as statistically significantly more influential with other faculty members on a series of indicators, including experience, ELA and mathematics knowledge, and access to external resources. The results are shown in Table 7.

Table 7. Comparison of Influentials and Other Faculty Members

	Common Core Assistance		Performance Assessment Assistance	
	Influentials (n= 22)	Other Faculty (n= 434)	Influentials (n= 32)	Other Faculty (n= 424)
Experience	11.94 (4.89)	11.80 (7.53)	12.23 (5.95)	11.78 (7.53)
ELA CCLS Knowledge	1.97* (.84)	1.46 (.99)	1.99** (.89)	1.45 (.99)
Math CCLS Knowledge	1.63** (1.03)	1.06 (.98)	1.68*** (1.03)	1.04 (.97)
External Resource Access	5.32** (2.92)	3.53 (2.83)	4.97** (2.74)	3.51 (2.84)

$p < .001$ = *** $p < .01$ = ** $p < .05$ = * $p < .10$ = ~

Experience. The survey sample in general was fairly experienced, with an overall average of 10.8 years of teaching experience. The influentials in the CCLS network had an average of 11.9 years of teaching experience, while the influentials in the performance assessment network had an average of 12.2 years of teaching experience. The individuals identified as influentials were only slightly more experienced, on average, as compared to other faculty members, but this difference was not statistically significant.

CCLS ELA and Mathematics Knowledge. Each survey respondent was assigned a content knowledge score in both ELA and mathematics based on a series of three questions in each topical area that were designed to gauge the respondent's understanding of the Common Core standards. The influentials in both the CCLS and performance assessment networks had significantly higher average knowledge scores in both content areas compared to the rest of the survey sample. The influentials in the CCLS network had an average ELA score of 1.97 and an average mathematics score of 1.63, whereas the other faculty members had average scores of 1.49 and 1.06 respectively. Likewise, the influentials in the performance assessment network had an average ELA score of 1.99 and an average mathematics score of 1.68, which were in both subject areas significantly higher than were other faculty members.

That the individuals who were identified as influentials in their respective scores also have, on average, higher expertise around the CCLS suggests that teachers and staff have appropriately identified people within their schools who may be able to offer them advice on understanding and implementing the CCLS.

Utilization of External Support. Survey respondents were given a list of external providers and asked which of them they accessed in the 2012-13 school year. On average, the individuals identified as influential in both the CCLS and performance assessment networks reported that they accessed external resources significantly more often than did other faculty members in their schools.

Together, these findings indicate that those who were greater resources to their colleagues were more knowledgeable about the Common Core in both mathematics and ELA, as well as more likely to seek information beyond the school about the Common Core.

Predictors of Influence

In this section of the report we examine the predictors of knowledge and influence. The culminating analysis focused on the third research question: What is the relationship between CCLS knowledge and influence and what individual- and grade-level characteristics are associated with them?

For these analyses we used only the data from the five elementary schools, structuring the data as teachers nested within grade-level teams. We also created two additional teams in each school, one for the school's administrators and one for the coaches in the school. While we considered including the middle school data in these analyses, we decided that the context of the team configurations across the elementary and middle schools was too different to merit their inclusion. Furthermore, there were too few teams in the middle schools (only 12) to do a separate middle school analysis.

The full dataset from the survey of the five elementary schools consisted of 265 faculty members. From these, we removed 74 individuals who were either not attached to a grade level or were not an administrator or coach (staff members such as librarians, guidance counselors, therapists, physical education teachers, k-5 special education teachers, etc.). The remaining 191 faculty members were either administrators, coaches, or teachers primarily assigned to a grade level.

Table 8. Sample of Faculty Members and Teams in Five Elementary Schools

	Individuals (n=191)	Teams (n=36)
Kindergarten Teams	27	4
Grade 1 Teams	23	4
Grade 2 Teams	25	4
Grade K-2 Teams	4	1
Grade 3 Teams	25	4
Grade 4 Teams	26	4
Grade 5 Teams	27	4
Grade 3-5 Teams	6	1
Coaches	13	5
Administrators	15	5

Factors related to Common Core and Performance Assessment Assistance

As discussed previously in this report, there was a lot of variation in the extent to which individuals were the recipients of requests for assistance about either the CCLS or performance assessments. In this part of the analysis, we looked to see if there were correlations between influence and knowledge, experience, and access to external resources.

Table 9 shows two models. The first model uses request for assistance about the Common Core as the dependent variable, while the second model predicts requests for assistance about performance- based assessments. Both models contain the same set of independent variables, which are mathematics and ELA knowledge, experience, position and pursuit of external resources. Both models also control for school size.

The first thing notable about these models is that mathematics knowledge is related to requests for assistance in both topical areas (CCLS and performance assessments). That is, more mathematics knowledge about the CCLS and performance assessments is associated with more requests for assistance. While ELA knowledge is not significant in either model, this is partly a function of the strong and significant correlation between mathematics knowledge and ELA knowledge ($r = .334$, $p < .001$). In fact, when mathematics knowledge is removed from the models, ELA knowledge becomes significant, albeit less strongly, in both models.

Table 9. Relationships between Requests for Assistance and Other Characteristics

Fixed Effects Parameter	CCLS Requests for Assistance (In-Ties)	Performance Assessment Requests for Assistance (In-Ties)
Intercept	17.95***	14.48***
	(2.14)	(1.85)
Mathematics CCLS Knowledge	.63*	.59**
	(.30)	(.24)
ELA CCLS Knowledge	.38	.17
	(.32)	(.25)
Experience	.012	.014
	(.03)	(.02)
Administrator	11.76***	9.85***
	(1.12)	(.94)
Coach	8.99***	6.04***
	(1.09)	(.91)
External Resources	.25**	.11
	(.09)	(.08)
School Size (# of Faculty)	.02~	.02
	(.01)	(.01)

$p < .001$ = *** $p < .01$ = ** $p < .05$ = * $p < .10$ = ~

Teachers' experience was not related to advice requests about either the Common Core or performance assessment, indicating that teachers did not turn to their colleagues for assistance based upon their level of experience. However, an individuals' position was related to requests for Common Core and performance assessment assistance. In both assistance networks, administrators and coaches received significantly more assistance requests than did teachers (the omitted variable, and hence the reference group). This may be a function of greater access to knowledge on the part of administrators and coaches, greater accessibility of coaches and administrators, their formal positions, or some combination of these factors.

There was also a significant relationship between seeking external knowledge resources outside of the school and requests for assistance about the Common Core, although not for assistance about performance assessments. This indicates that people who were seekers of more external knowledge were also significantly more likely to be asked for assistance.

The second set of models we examined looked at predictors of mathematics and ELA knowledge about the Common Core. The predictors we examined were individual experience, position, and pursuit of external resources. These models are shown in Table 10. Experience was *negatively* related to Common Core mathematics knowledge, with less experienced individuals having slightly more mathematics knowledge than more experienced people. There was no relationship between Common Core ELA knowledge and experience.

Table 10. Relationships between Subject-Matter Knowledge and Individual Characteristics

Fixed Effects Parameter	Common Core ELA Knowledge	Common Core Mathematics Knowledge
Intercept	1.725*** (.477)	1.998*** (.530)
Experience	.011 (.007)	-.014~ (.007)
Administrator	4.37~ (.26)	.332 (.291)
Coach	.073 (.259)	-.163 (.285)
External Resources	.041~ (.023)	.011 (.025)
School Size (# of Faculty)	.003 (.003)	-.001 (.003)

$p < .001$ = *** $p < .01$ = ** $p < .05$ = * $p < .10$ = ~

In terms of position, administrators had more ELA Common Core knowledge than teachers, but coaches and teachers had similar levels of knowledge. These are patterns we saw previously in the descriptive statistics in Tables 2 and 3. Administrators, teachers, and coaches had no differences in Common Core mathematics knowledge.

Finally, and importantly, knowledge is related to seeking external resources. Common Core knowledge in ELA was related to reaching out for more external resources, with more resource pursuit positively associated with more Common Core ELA knowledge. There was no relationship between external resource use and Common Core mathematics knowledge.

Discussion and Implications for Practice

Developing instructional capacity in schools is a central challenge of the Common Core State Standards movement. While most conceptualizations of building teacher capacity focus on infusing externally generated professional development into schools, in this paper we explore the professional resources that reside within schools that might be utilized to build instructional capacity from within.

This study focused on two particular internal resources for instructional improvement in this time of press to implement the Common Core: subject-matter knowledge about the Common Core and professional communication around implementing the Common Core. The findings of this study lend support to the idea that these important resources for school improvement reside within schools and that these resources are generally shared by those who hold them. Many faculty members performed well on our assessments of ELA and mathematics Common Core knowledge and many reported frequent discussions about the Common Core and offered assistance to their peers on Common Core topics and practices.

However, equally noteworthy to the presence of these resources within schools was the unequal way in which they were distributed amongst grade-level teams. An analysis of team-level Common Core knowledge and communication indicated substantial variation both *across teams* in knowledge and communication as well as *within-team variation* in these measures. More specifically, teams seemed to be relatively knowledgeable in one subject or the other (but infrequently both) and to have stronger or weaker within-team communication about the Common Core. Yet the combination of knowledge and communication were more often to be varying within teams, rather than consistently high or low. In fact, within teams there is much more variation in knowledge than communication. This can be seen in the stronger correlation in the elementary schools between communication about the Common Core and performance assessments (r=.66) than the correlation between ELA and mathematics knowledge (r=.28). From this we observe that communication patterns are more transferrable across topics than Common Core knowledge is transferrable across subjects. This makes sense in that communication habits are more easily translated across topical areas than is Common Core content knowledge.

While knowledge and communication within elementary school grade-level teams and middle school subject-matter teams was a central focus of this investigation, we also noted the role of particular individuals who acted as conduits for the transfer of knowledge about the Common Core. At the individual level, the key takeaway from this report is the strong statistical relationship between Common Core subject-matter knowledge (particularly in mathematics) and being a recipient for Common Core advice. That is, those individuals with more knowledge about the Common Core tended to be those who were more sought after for assistance about the Common Core. This indicates that teachers within schools were able to identify who had subject-matter knowledge and sought the input of those individuals. This is an important finding for the success of a within-school capacity utilization strategy.

Even within this overall pattern, there was a relatively small cadre of individuals who were particularly sought after as wellsprings of information about the Common Core. In fact, only 56 individuals, or just 11 percent, of the 495 people who were identified on the social network component of the school surveys, were classified as significantly influential. These individuals tended to be administrators and coaches who were more accessible than classroom teachers. While these influential individuals had significantly more knowledge about the Common Core in both ELA and mathematics than the typical faculty member, they were no more experienced than the typical faculty member. One other important distinguishing attribute of these influential individuals is that they sought out resources external to the school more than the typical faculty member, which may be associated with their higher levels of knowledge.

A final important finding from this study was the variation in patterns of external resource seeking for study participants and the correlation between a number of desirable qualities and the seeking of resources outside of the school. First, external resource access was an attribute of those who were more knowledgeable about the Common Core in both ELA and mathematics. Second, external resource seeking was also correlated with those who were recipients for advice from their colleagues within schools. Thus, those with a thirst for professional knowledge about the Common Core who took the time to access external resources on the topic were both more knowledgeable about the Common Core and sought after resources in their school.

The implications of these findings for school and district leaders are multiple. First, the findings provide evidence that there is under-acknowledged capacity that resides within schools. While we often recognize the inadequacy of 'one size fits all' professional development, we rarely infer the corollary that there is substantial knowledge and social capital operating within schools that might be catalyzed to support improvement. By pointing this out, we do not mean to suggest that sufficient knowledge resides within schools and that externally generated professional development is unnecessary, but we do conclude that there is expertise within schools that can be more effectively utilized to support instructional engagement.

Leaders who seek to build upon the instructional capacity within their schools and districts might explore mechanisms to tap into this existing capacity and seek ways to spread the existing resource amongst the staff. This might mean creating opportunities within schools for teachers to engage together around implementation challenges, or structuring tasks that require teachers to question and learn from each other, or simply creating opportunities to exchange strategies or ideas.

Second, the findings suggest that leaders should seek to identify who holds the existing capacity within their organization and strategically make those individuals more accessible to those in need of support. These individuals should also be positioned to connect subgroups that are otherwise unconnected.

Third, the creation of, awareness of, and access to external resources are important attributes for developing knowledge within schools. This way of thinking about and interacting with external resources is different than typical professional development that focuses on building and directing a particular capacity. Rather, access to resources means making sure that people: a) know what external resources are available to them, b) provide school faculty members with the means to access external resources, and c) even centrally create some of the resources that school faculty can access.

The choice of leading with rigorous standards as a lever for catalyzing dramatic changes in teaching to substantially improve student learning assumes that state and local educators will develop mechanisms to help teachers build the capacity to teach to the new and more challenging standards. This raises the essential question of where the capacity to teach differently will come from and how educational leaders will build the capacity of teachers to teach to new standards. In response, many districts have revved up their professional development systems and/or sought out providers that claim to have special Common Core expertise. These are undoubtedly important aspects of a teacher capacity-building strategy. But this report also provides supporting evidence that substantial human and social resources exist within their very schools. Consequently, a dual strategy to build teacher capacity would be to build both from the inside-in as well as from the outside-in. Both internal and external capacity can maximize the resources to meet the challenges posed by higher standards for student performance.

Appendix A. Survey Samples and Response Rates by School

School	Total Number of Staff on Roster	Total Surveys Received	% Complete
1	89	66	74%
2	86	72	84%
3	63	52	83%
4	34	33	97%
5	18	18	100%
6	109	101	93%
7	62	52	84%
8	63	62	98%
Total	524	456	89%

Appendix B. Survey Instrument

Graduate School of Education Penn GSE

Common Core School Survey

This survey is part of an independent research project being conducted by researchers at the University of Pennsylvania, at the behest of the GE Foundation, which has provided substantial support to Common Core Learning Standards implementation in New York City. The purpose of the project is to understand the combination of knowledge and communication that facilitate Common Core Learning Standards implementation. The survey in particular focuses on faculty knowledge and interactions around the Common Core Learning Standards. The survey is voluntary and completely confidential; all data will only be presented in aggregated form, and neither individuals nor schools will ever be identified. Your confidentiality is guaranteed by the Institutional Review Board of the University of Pennsylvania. By completing this survey you agree to participate in this research project. Thank you in advance for your time and participation.

I. ABOUT YOU

1. How would you describe your current role in your school? ________________________________
2. If you are a teacher, which grade level(s) and subject(s) do you teach this year? ______________________
3. How many years, including this year, have you been a teacher? ______________________
4. How many years, including this year, have you been a teacher in this school? ____________

II. ABOUT YOUR PROFESSIONAL RELATIONSHIPS

We are interested in the professional communication networks that are established in schools between individuals. In other research, communication networks have been shown to reveal important characteristics of organizational functioning. For this reason, in the following section we ask you to identify those who you work with in particular areas. These data will be used to map the connections between people in schools. Please be assured that no individual or school will ever be identified in reports produced from these data.

5. Who in your school do you turn to for advice or information about *fulfilling your job responsibilities*?

	This year, how often have you sought guidance from this person?				How influential is the advice of this person?			
Please list up to five Staff IDs. You need not use all 5 spaces.	A few times a year	Once or twice a month	Once or twice a week	Daily or almost daily	Not influential	Slightly Influential	Influential	Highly Influential
1.	O	O	O	O	O	O	O	O
2.	O	O	O	O	O	O	O	O
3.	O	O	O	O	O	O	O	O
4.	O	O	O	O	O	O	O	O
5.	O	O	O	O	O	O	O	O
O I do not seek advice from anyone in the school about *fulfilling my job responsibilities*.								

6. Who in your school do you turn to when you have questions about the *Common Core Learning Standards*?

	This year, how often have you sought guidance from this person?				How influential is the advice of this person?			
Please list up to five Staff IDs. You need not use all 5 spaces.	A few times a year	Once or twice a month	Once or twice a week	Daily or almost daily	Not influential	Slightly Influential	Influential	Highly Influential
1.	O	O	O	O	O	O	O	O
2.	O	O	O	O	O	O	O	O
3.	O	O	O	O	O	O	O	O
4.	O	O	O	O	O	O	O	O
5.	O	O	O	O	O	O	O	O
O I do not seek advice from anyone in the school about the *Common Core Learning Standards*.								

7. Who in your school do you turn to when you have questions about *implementing performance assessments (performance tasks)*?

	This year, how often have you sought guidance from this person?				How influential is the advice of this person?			
Please list up to five Staff IDs. You need not use all 5 spaces.	A few times a year	Once or twice a month	Once or twice a week	Daily or almost daily	Not influential	Slightly Influential	Influential	Highly Influential
1.	O	O	O	O	O	O	O	O
2.	O	O	O	O	O	O	O	O
3.	O	O	O	O	O	O	O	O
4.	O	O	O	O	O	O	O	O
5.	O	O	O	O	O	O	O	O
O I do not seek advice from anyone in the school about *implementing performance assessments (performance tasks)*.								

III. EXTERNAL PROVIDERS

8. Please mark all of the resources outside of your school to which you have turned for help or advice on Common Core planning and implementation this school year.	Do Not Use this Source	This year, how often have you sought guidance from this source?				How influential is the advice of this source?			
		A few times a year	Once or twice a month	Once or twice a week	Daily or almost daily	Not influential	Slightly Influential	Influential	Highly Influential
1. Achievethecore.org	O	O	O	O	O	O	O	O	O
2. Aussie	O	O	O	O	O	O	O	O	O
3. CommonCore.org	O	O	O	O	O	O	O	O	O
4. Common Core Fellows	O	O	O	O	O	O	O	O	O
5. DOE Common Core library	O	O	O	O	O	O	O	O	O
6. Other teachers in your district	O	O	O	O	O	O	O	O	O
7. Teachers College	O	O	O	O	O	O	O	O	O
8. Teaching Channel	O	O	O	O	O	O	O	O	O
9. UFT	O	O	O	O	O	O	O	O	O
10. Your network (CFN)	O	O	O	O	O	O	O	O	O
11. Other (please identify): ____________	O	O	O	O	O	O	O	O	O
12. Other (please identify): ____________	O	O	O	O	O	O	O	O	O
13. Other (please identify): ____________	O	O	O	O	O	O	O	O	O

IV. ABOUT THE COMMON CORE LEARNING STANDARDS

With the following questions, we are trying to get a sense of your school's overall experience with the Common Core Learning Standards. Even if you do not teach the subject of the question, please answer each question to the best of your ability.

9. According to the Common Core State Standards: English/Language Arts, which of the genres needs further emphasis? (Mark ONE.)

O Poetry O Historical text O Drama O Stories O I don't know

10. The Common Core's College and Career Readiness Anchor Standards for Writing refer to which of the following types of writing? Mark all that apply.

O Creative writing O Narrative writing O Argumentative writing

O Poetry O Informational/explanatory writing O I don't know

11. According to the Common Core State Standards: English/Language Arts, which of the following is *not* a characteristic of text-dependent questioning? (Mark ONE.)

O Students are expected to cite evidence from text.
O Students are expected to connect to text through personal narrative.
O Questions are expected to be focused and grounded in the text.
O Text-dependent questions should be used with both literature and informational texts.
O I don't know.

12. Which of the following topics is *not* included in the Common Core State Standards for Mathematics *in grades K-5*? (Mark ONE.)

O Probability O Geometry O Measurement O Algebraic Thinking O I don't know

13. Which of the following are emphasized in the Common Core State Standards for Mathematics? Mark all that apply.

O Application O Use of manipulatives
O Computational fluency O Conceptual understanding
O Having students work in small groups to solve problems O I don't know

14. Which of the following statements accurately reflects the Common Core's Standards for Mathematical Practice? (Mark ONE.)

O The Mathematical Practices describe the content to be taught at each grade level.
O Students need to have basic skills before engaging with the Mathematical Practices.
O The Mathematical Practices should be emphasized at all grade levels.
O The Common Core emphasizes different Mathematical Practices at each grade level.
O I don't know.

Thank you for your participation!
Please return this survey to the University of Pennsylvania authorized administrator.

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