Teachers' Use of Data:

An Executive Summary

Raeal Moore, PhD

Teresa Shaw

ACT®

Raeal Moore is a senior research scientist specializing in survey methodological research and research on education best practices in P–12 schools.

Teresa Shaw is a senior consulting statistician with Pastor, Behling & Wheeler, an environmental consulting firm. From 2007 to 2015, she worked as a senior software engineer and statistical analyst at ACT and researched performance growth and value-added modeling for schools and districts.

The purpose of this report is to provide a descriptive account of teachers' use of data for decision making in one midwestern state. Included in this report is a summary of how often teachers use data, their perceptions of data decision-making utility, confidence in using data, and the organizational mechanisms present to support data use. The report concludes with distinct barriers to data use.

Acknowledgments

The authors would like to thank the cross-functional team at ACT who provided invaluable guidance on the research design and survey development. These individuals are Chrys Dougherty, Teri Fisher, Laura Stevens, and Briana Huntsburger. A special thanks to Jeff Wayman who provided feedback on early versions of each survey.

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Introduction

In February of 2012, teachers in one Midwestern state were invited to participate in *ACT's Teacher Data Use Survey* to ascertain their self-reported beliefs, attitudes, and actions related to using data. We defined data use or data-informed decision making as "systematically analyzing existing data sources within the school, applying outcomes of analyses to innovate teaching, curricula, and school performance, and, implementing (e.g. genuine improvement actions) and evaluating these innovations" (Schildkamp & Kuiper, 2010).[1] In the survey, we focused on specific types of data including:

- National and state achievement test data (e.g., Stanford 9, K-Prep, ACT, SAT)
- Formal assessments (e.g., district benchmark assessments)
- School assessments (e.g., quizzes, grades, assignments)
- Other student data (e.g., disciplinary information, ELL status, supplementary education participation, student retention)
- Other data (e.g., survey data, classroom walkthrough data)

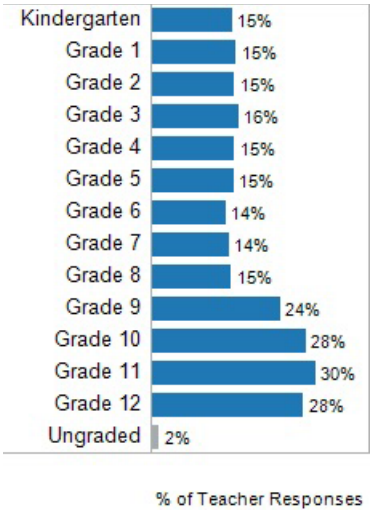
Teachers were instructed to think of these types of data when answering the survey questions. Teachers were asked to report how frequently they use these data to: inform instruction, support students' self-directed learning, identify quality educational programs and services, and identify professional development. Responses to the level of usefulness that accessible data had for decision-making were also requested. Moreover, since the frequency and usefulness of data are only as meaningful as the context in which they are used, we also sought to ascertain school- and district-level support mechanisms for effective data use, teachers' perceptions of the quality of the data available, and teachers' confidence in using data. Barriers, whether perceived or actual, were also obtained. For more details about the specific questions, please see the copy of the survey instrument in Appendix A3.

The remainder of this report summarizes teachers' responses on *ACT's Teacher Data Use Survey*. We begin by describing the teachers who responded to the survey. We then move into the major areas of data use believed to be important conditions for using data effectively. We conclude with an overall summary of results and a resource page listing the literature that describes the factors that shape effective data use. Appendix A presents a technical summary of item development, survey administration, and data analysis.

Who Responded?

ACT's Teacher Data Use Survey was completed[2] by 8,238 (20%) of all teachers, across 1,093 (92%) of the principal or head teacher controlled schools, in 168 (97%) of the state's school districts.

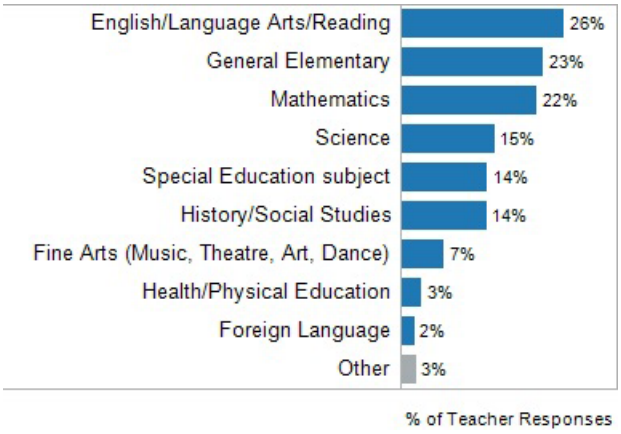
Most of the responding teachers were full-time (97%), female (80%), and White (95%). The respondents had an average of 14 (*S.D.* = 9.1) years of teaching experience, with most of this experience in the school and district in which the teacher is currently employed (district *M* = 11, *S.D.* = 8.3; school *M* = 9, *S.D.* = 7.4). Figure 1 shows the distribution of teachers based on respondents' answers to which grade(s) are taught. More than one grade can be selected. The percentage of teachers who selected the high school grades (i.e., grades 9–12) is considerably higher than percentages for other grades. Over 90% of teachers who selected these high school level grades also selected other grade(s).



Note: A respondent may have selected one or more grades. Over 90% of teachers who selected Grade 9–12 also selected other grade(s). The percentage of teachers responding to one of these grades is considerably higher than the percentages for other grades.

Figure 1. Percentage of teachers responding by grade

The majority of teachers who responded to the survey teach general elementary or one of the four primary core subject areas (e.g., English, mathematics, science, history/social studies). Non-core subject areas were also represented, but for the most part, to a lesser extent (e.g., fine arts, health/physical education, and foreign language). The "Other" subject area included teaching in areas like: Intervention, Technology, Response to Intervention (RTI), and Arts and Humanities (see Figure 2).

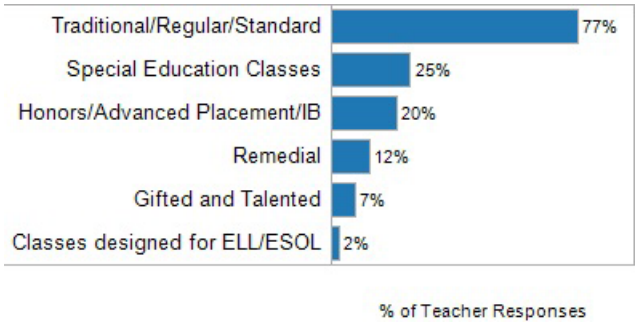


Note: A respondent may have selected one or more of these categories. Only the top ten categories are presented in this subject area chart. The remaining 14 subject area categories in the survey were selected less than 2% of the time.

Figure 2. Percentage of teachers responding by subject area

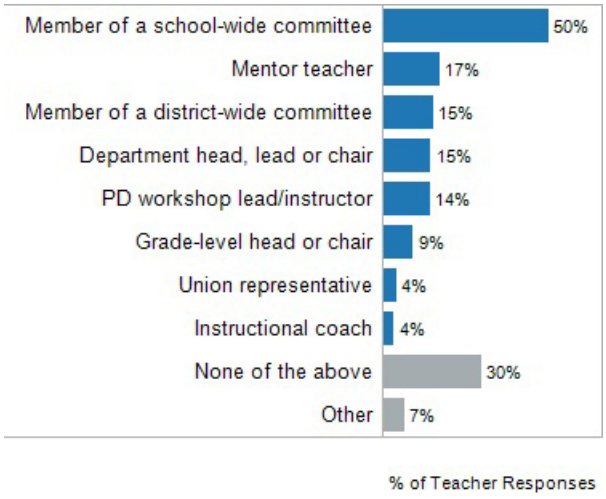
Over two-thirds (77%) of the teachers work in a traditional classroom, and between 2% to 25% of teachers, depending on the class type, work in other kinds of classrooms (see Figure 3). One in four teachers reported teaching special education classes, and almost as many respondents (20%) teach advanced level course work (i.e., honors, advance placement and International Baccalaureate). There were fewer teachers (2%) who taught English as a Second Language (ELL/ESOL).

Teachers who responded to the survey also hold positions outside of the classroom hours (70%). Here, half (50%) of these teachers indicated they serve on a school-wide committee or task force in addition to maintaining their teaching load. Fewer reported serving as a mentor teacher or sitting on a district-wide committee. Four percent were classroom teachers and served as a union representative or instructional coach (see Figure 4).



Note: A respondent may have selected one or more of these categories.

Figure 3. Percentage of teachers responding by type of class taught



Note: A respondent may have selected one or more of these categories.

Figure 4. Percentage of teachers responding by position held

Making Meaning from the Numbers

At ACT, we are in the business of presenting numbers to people. When we present a number, there is a level of precision associated with that number. Many things affect this precision including how much data are used to estimate the number. When a number is based on hundreds of thousands of pieces of data, it is very precise. However, the more precise the number, the more likely we are to find statistically significant differences when comparing across groups and items even if the differences might not be meaningful. We need to be able to determine to what degree differences in comparative analyses are of practical importance. Therefore, when comparisons are made between school levels (i.e., elementary vs. middle vs. high school) on key survey measures, we will measure the absolute difference between groups relative to the overall standard deviation. This estimate is often referred to as effect size. We believe that an effect size of approximately 0.20 is meaningful, although you as the practitioner should determine if differences are meaningful given your context.

In addition, it may be that only certain groups in the population respond. This can lead to situations in which the sample does not look like the entire population in which we are interested. We try to get as representative a sample as possible, but there may be certain types of teachers who respond to the survey and a different sort who do not respond. We provide exploratory results as to whether those teachers who responded look like the teacher population in the state in Appendix A. However, given the limited data available at the state level, we recommend being cautious in generalizing the results presented here to the entire teacher population from this Midwestern state.

Teachers' Self-Reported Responses on Data-Informed Decision Making

What types of data do teachers have access to and how useful are these data?

Teachers were asked if they have access to a variety of types of data and how useful they found those data to be. The teachers reported having access to most data types generated from students' scores on state, district, and school tests, as well as having access to student grades, behavioral data, course enrollment, and attendance. Less than half of the respondents reported that they had access to school-wide survey responses from students, parents, or teachers. Figure 5 shows how useful teachers felt some of the data types were for decision-making. In general, teachers felt the data were useful, with most scores above the midpoint of the scale ("somewhat useful"). The bars in the graph show the mean usefulness scores for all the teachers who responded. The different colored points refer to the mean usefulness scores for teachers who responded from different school levels. Only teachers who indicated they had access to the data element recorded the degree to which it was useful.

Teachers at all levels felt data were at least somewhat useful for decision making. Interestingly, for nine of the data elements, elementary teachers (blue) reported the data to be more useful for decision making than high school teachers (purple), as shown with an "*" and five occasions where middle school teachers (green) found data elements to be more useful than high school teachers, as shown with an "^." We identify differences between school levels by highlighting when the effect size was at least 0.20.

Note: Superscripts were used when the effect size was at least 0.20. *= ES vs. HS; "= ES vs. MS; ^= MS vs. HS. In some cases, only two dots are visible. This is because two school level means are almost exactly the same. A gray bar represents the mean teacher response across school levels. A colored point represents the mean teacher response for a given school level.

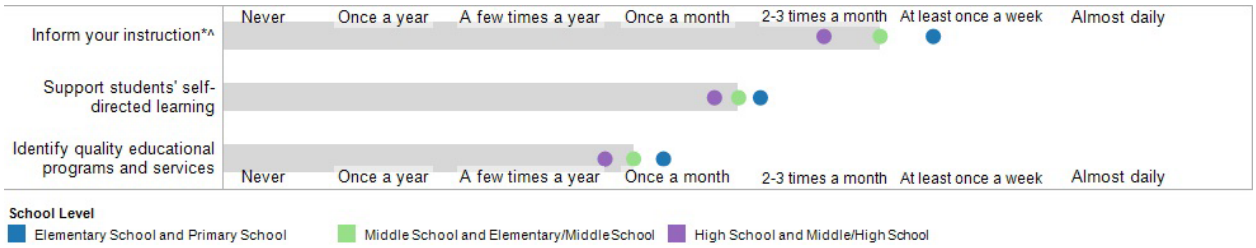
Figure 5. Accessible and useful data elements by school level

How often do teachers use data for decision making?

Teachers were asked 10 questions about how often they used data to inform their instruction, five questions about using data to support students-self-directed learning, five questions about how often teachers used data to identify quality educational programs and services, and nine questions associated with using data for other teaching responsibilities. The means for these were computed to create three data use variables: data use to inform your instruction, data use to support student self-directed learning, data use to identify quality educational programs and services (summarized in Figure 6). Data use for other teaching responsibilities were analyzed at the item level. Figure 7 summarizes the results, by item, associated with using data for other teacher responsibilities.

We explored whether the frequency by which teachers used data differed by school level—elementary, middle, or high school. In general, we found that in 2013, elementary and middle school teachers reported using data to inform their instruction more frequently than did their high school counterparts. Furthermore, comparing across the different ways of using data, all teachers reported more frequently using data to inform their instruction, followed by using data to support students' self-directed learning. This latter point is interesting since older students

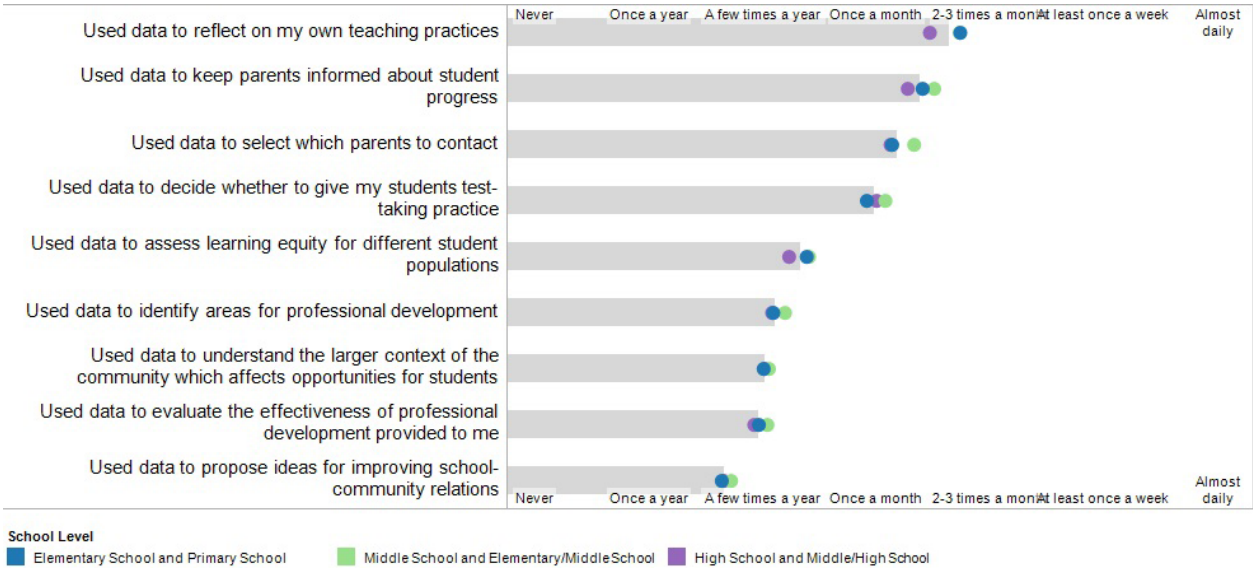
should be better able to self-direct their learning than younger students, but the results from different educational levels are similar. Teachers used data to identify and evaluate quality educational programs approximately once a month.



Note: Superscripts were used when the effect size was at least 0.20. *= ES vs. HS; "= ES vs. MS; ^= MS vs. HS. A gray bar represents the mean teacher response across school levels. A colored point represents the mean teacher response for a given school level.

Figure 6. Frequency of data use by school level

Teachers, however, did not differ "significantly" by school level in terms of their frequency of data use in reflecting on their own teaching, working with parents and the community, or identifying their own professional development (Figure 7). Teachers in general were more likely, on average, to use data in the teaching and learning process than they were to use data to work with the community and identify their own professional development.



Note: A gray bar represents the mean teacher response across school levels. A colored point represents the mean teacher response for a given school level.

Figure 7. Frequency of "other" data uses by school level

What are teachers' attitudes about data, and how confident are they in using data?

Positive attitudes towards using data and confidence in one's own ability to use data are closely related. Teachers were asked seven questions about their attitudes towards using data and five questions about their confidence in their own ability to use data. The means for these were computed to create an "attitude towards data variable" and "confidence using data"

variable. Figure 8 shows the responses on these, where values from 1 to 6 represent the scale from “Strongly Disagree” to “Strongly Agree”. Each individual teacher is shown with a dot, and the school level means are shown with a X. Most of the data are in the top right corner, showing that most teachers have positive attitudes towards data and are fairly confident using data. Analyses were conducted to determine if there were differences by school level on attitudes towards using data and confidence in one’s own ability to use data. Compared to their high school counterparts, elementary (effect size = .21) and middle school teachers (effect size = .22) had more positive attitude towards using data. There were no differences across school level when it came to level of confidence to use data.

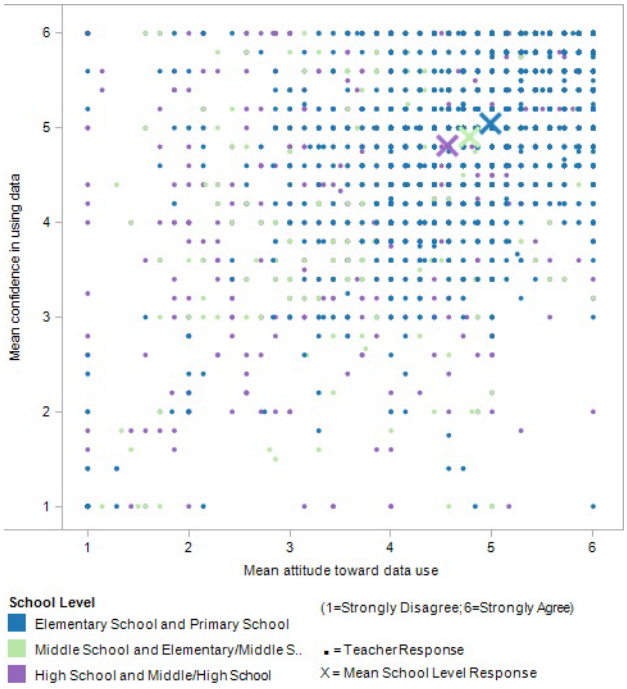


Figure 8. The relationship between confidence in one’s own ability to use data and attitude towards using data

What are teachers’ beliefs about benchmark and state assessment data?

Teachers were asked five questions about their beliefs concerning district benchmark assessment data and five questions about their beliefs concerning state assessment data. These questions asked about: applicability to work, ease of interpretation, whether it is a good measure of student learning, whether it is easily assessable, and whether it is aligned well to curriculum standards. Overall, there was slightly more satisfaction with the district benchmark assessment data relative to state assessment data. In particular, teachers believed that the benchmark assessment data are easier to interpret, better measures of student learning, and more easily accessed when needed. In order to explore the association between beliefs about benchmark and state assessment data, and to explore differences by school level, we constructed scales for benchmark and state data by taking the average of responses to the five questions for each type of assessment.

Figure 9 shows the district benchmark assessment variable plotted with the state assessment variable. The largest group of data is in the upper right quadrant. These are teachers who are generally favorable to both types of assessments. Overall, positive beliefs about one assessment type were correlated with positive beliefs about the other assessment type. However, teachers were more positive about benchmark data than they were of state data.

Likewise, we tested to see if there were differences between elementary, middle school, and high school teachers associated with these two types of assessment data. There were differences in beliefs about benchmark assessment data, with elementary and middle school teachers reporting more positive attitudes; high school teachers were on average the least positive. For school level beliefs about benchmark data, effect sizes were 0.20 for the elementary vs. high school comparison and for the middle school vs. high school comparison. For school level beliefs about state data, all effect sizes were less than 0.20.

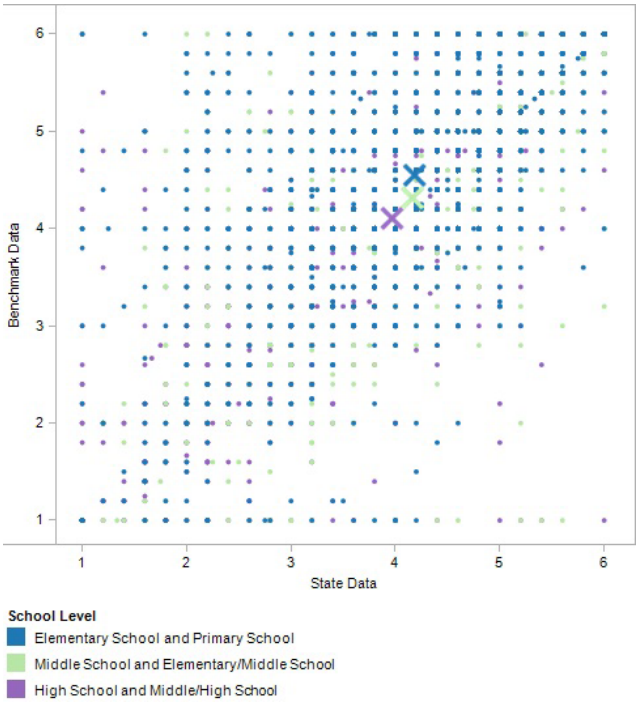


Figure 9. The relationship between beliefs about district assessment data and state assessment data, by school level

What types of professional development on data use do teachers receive and how impactful is it?

Professional development (PD) is a key way in which district and school administrators can enhance teachers' use of data. Overall, 36% of teachers reported that, in the past academic year, they had four hours or less of professional development focused on using data. This percentage was similar across elementary, middle, and high schools. Twenty-six percent said that they had between 4–8 hours, 16% between 9–16 hours, 9% between 17–24 hours, and 13% above 24 hours.

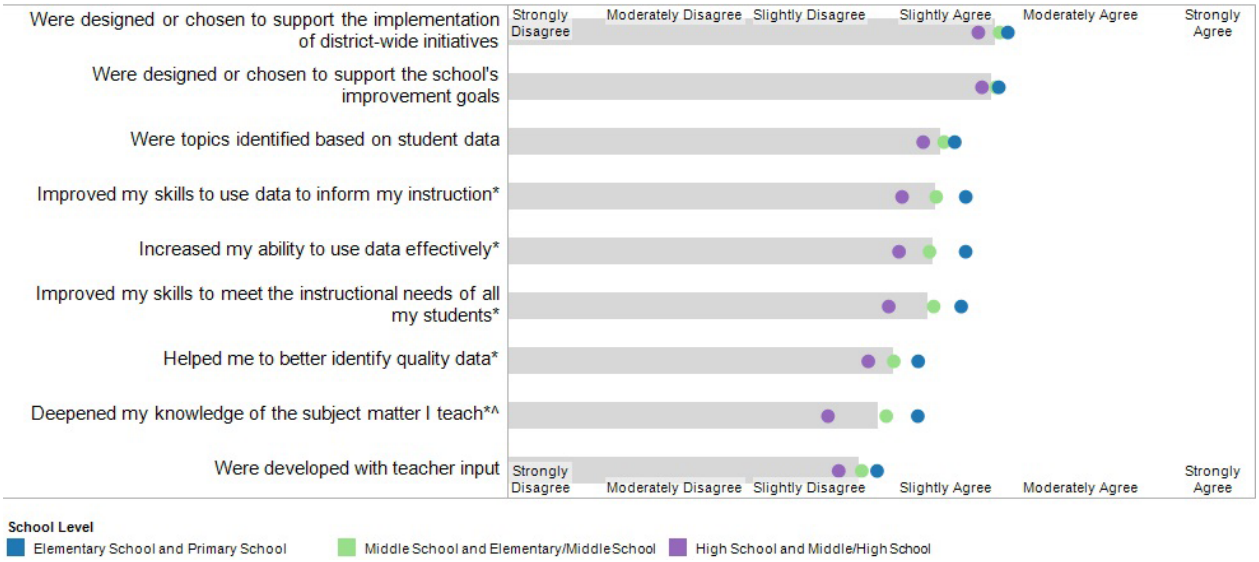
Figure 9 shows the mean usefulness of the professional development on a scale from 1 (“not useful”) to 5 (“extremely useful”) as well as the percentage of teachers who report that the professional development activity was provided by the school and/or the district. Approximately three out of four teachers (77%) indicated having PD that helped them to interpret data to identify students’ instructional need. However, teachers had much less exposure to PD that helped them to synthesize multiple measures (37%). On average, teachers reported that the professional development on data use provided to them was “somewhat” useful. High school teachers reported that the PD was less useful than their elementary school teacher counterparts, with an effect size of 0.22, on nine of the 11 items (as shown with an “*” in Figure 10). Likewise, middle school teachers found five PD areas more useful than high school teachers (as shown with a “^” in Figure 10).

Note: Superscripts were used when the effect size was at least 0.20. *= ES vs. HS; “= ES vs. MS; ^= MS vs. HS. A gray bar represents the mean teacher response across school levels. A colored point represents the mean teacher response for a given school level.

Figure 10. Professional development usefulness by school level

Teachers were asked several questions to gauge their attitudes towards the professional development they received on data use. The questions asked whether the PD “deepened my knowledge of the subject matter I teach” and “increased my ability to use data effectively.” The average scores for most questions (7 of 9) were around “slightly agree” (see Figure 11). In over half the items, elementary school teachers were more inclined to agree that the PD provided had an impact relative to high school teachers (as shown with an “*”). However, on the whole, teachers had neither strong negative nor strong positive attitudes towards professional development designed to promote data use. The fact that teachers were neutral

in their perceived impact PD had on their learning and behavior might help to explain why these teachers perceived the PD to be only "somewhat" useful. Interestingly, teachers reported that the PD was designed to support district and school initiatives but were not as likely to be developed with teacher input.

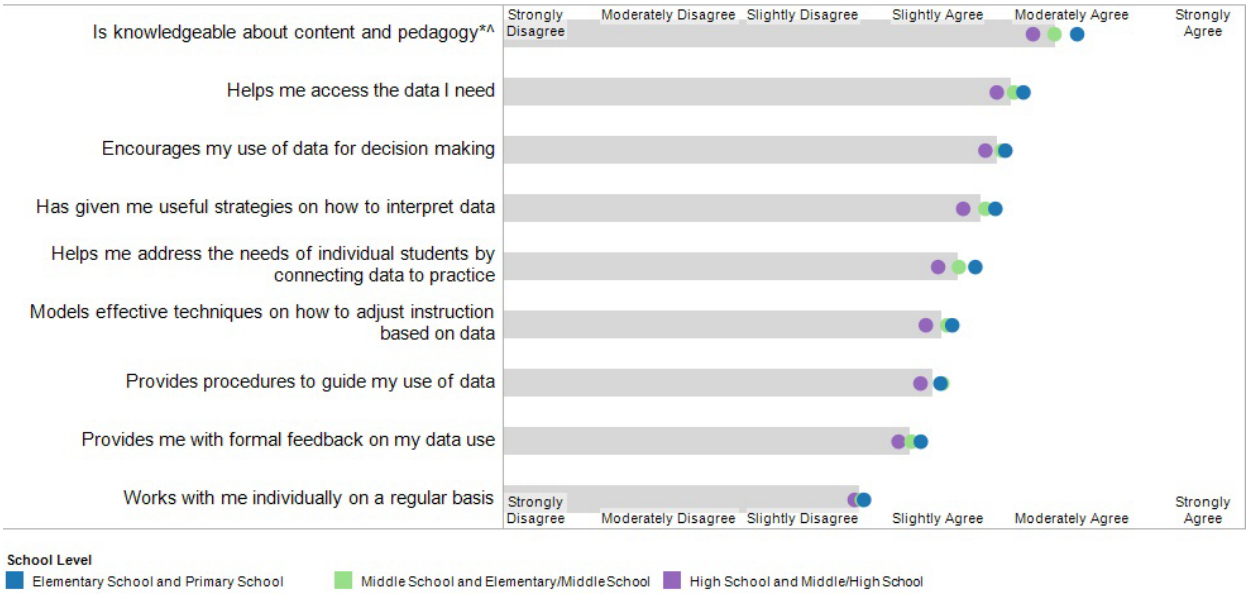


Note: Superscripts were used when the effect size was at least 0.20. *= ES vs. HS; "= ES vs. MS; ^= MS vs. HS. A gray bar represents the mean teacher response across school levels. A colored point represents the mean teacher response for a given school level.

Figure 11. Professional development impact by school level

Do teachers have access to a data expert, a formal position within the district or school?

Teachers were asked whether they had access to a district or school data expert, a person who is knowledgeable about how to use data to inform decision making (e.g., literacy coach, mathematics or data coach, or a mentor). Approximately 67% of teachers reported having a data expert. There were several schools (63%) where one teacher said they had a data expert while others did not. This likely means that some teachers had contact with a school or district sponsored data expert or they found a person who they considered to be a data expert, but others had not. Based on these results, there does not appear to be one person (or group of persons) formally designated and advertised as a go-to support for data use at most schools. Of the 67% of teacher who indicated they had access to a data expert, they were more likely to agree that this person was knowledgeable about content and pedagogy than they were to indicate that the coach worked with them individually on a regular basis (Figure 12).

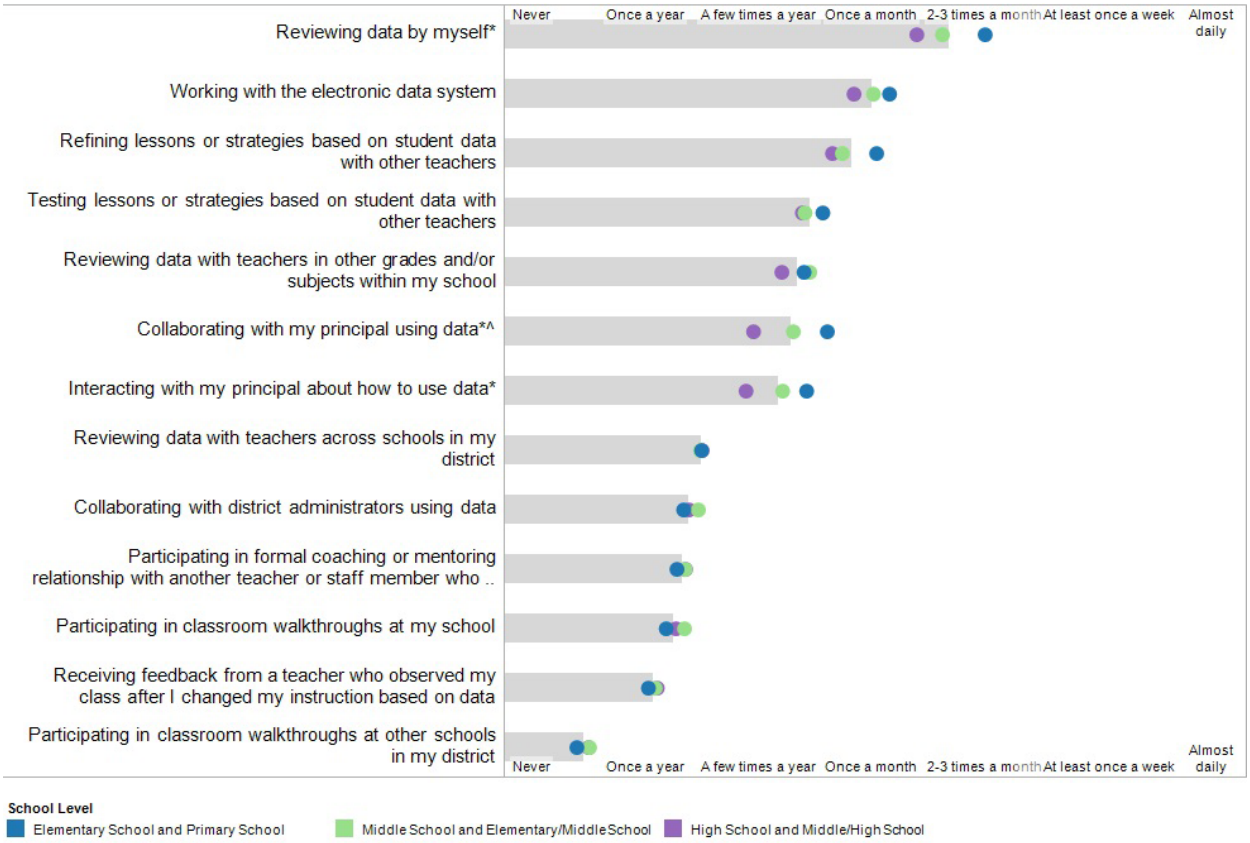


Note: Superscripts were used when the effect size was at least 0.20. *= ES vs. HS; "= ES vs. MS; ^= MS vs. HS. A gray bar represents the mean teacher response across school levels. A colored point represents the mean teacher response for a given school level.

Figure 12. Data expert characteristics by school level

How often do teachers collaborate with colleagues on data use?

Teachers were asked how often they collaborated with colleagues on a variety of data use activities, including using data to test and refines lessons or strategies, review data with teachers across school in their district, and receive feedback from a teacher who observed his/her class after changes in instruction were made based on data. Teachers, across school levels, indicated they reviewed data by themselves more often than they collaborated with others in using data (Figure 13).



Note: Superscripts were used when the effect size was at least 0.20. *= ES vs. HS; "= ES vs. MS; ^= MS vs. HS. A gray bar represents the mean teacher response across school levels. A colored point represents the mean teacher response for a given school level.

Figure 13. Collaboration with colleagues by school level

What are the types of barriers teachers report?

Teachers were asked what they felt were barriers for data-informed decision making in their schools. Thirteen potential barriers were listed, and teachers indicated whether the potential barrier was not a barrier, was a minor barrier, or was a major barrier. We classified these into three groups.

Table 1. Barriers to Data Use.

Label	Definition	Potential barriers in this category. Lack of . . .
Not a barrier	<50% of responses said either minor barrier or major barrier	• electronic data system • data on student performance in specific subject areas
Barriers	between 50% to 75% of responses said either minor barrier or major barrier	• school staff-preparation for decision making • technical skill of school staff • district leadership support for data-informed decision making • sharing data across departments within a district • policies that provide direct access to data system
Major barrier	> 75% of responses said either minor barrier or major barrier	• time for data-informed decision making activities

Conclusions

The goals of ACT's research on data use best practices are to understand how data are being used by educators at various levels of the organizational system—teachers, school leaders, and district administrators—to identify which practices yield the greatest impact on student growth, to highlight the ways in which educators are successful in using data, and to identify where ACT might provide support in improving educators' data-informed decision making. Responses from teachers have helped us to move towards our principle goal of helping educators improve data-informed decision making.

Thank you! Thank you to the principals who endorsed the survey, and thank you to the teachers for filling them out. We know *time* is precious and that that a teacher filling in a survey is one of many requests that go beyond the usual teacher role. We thank you for filling this out. We know that you do it because you trust that we are using these data to improve student's education. Your trust is important to us, and your effort will help us to achieve our shared goal of improving education.

Endnotes

1. Schildkamp, K. & Kuiper, W. (2010). Data-informed curriculum reform: Which data, what purposes, and promoting and hindering factors. *Teaching and Teacher Education, 26*, p. 482–496.
2. Completion was defined as any respondent who answered at least 20% of the survey questions.

Resources

Here we provide a reference list of research studies that indicates the importance of various factors (e.g., access to data, access to an electronic data system and expert, and school and district leadership) informing effective data use in schools. We end with research that supports the claim that using data is important for student achievement, administrator leadership, and organizational change.

Access to data:

Coburn, C. E., & Turner, E. O. (2011). Putting the "use" back in data use: An outsider's contribution to the measurement community's conversation about data. *Measurement: Interdisciplinary Research and Perspective, 9*(4), 227–234.

Honig, M. I., & Venkateswaran, N. (2012). School-central office relationships in evidence use: Understanding evidence use as a systems problem. *American Journal of Education, 118*(2), 199–222.

Marsh, J. A., Pane, J. F., & Hamilton, L. S. (2006). *Making sense of data-driven decision making in education.* Santa Monica, CA: RAND Education.

Access to an electronic data system:

Coburn, C. E., & Turner, E. O. (2011b). Putting the "use" back in data use: An outsider's contribution to the measurement community's conversation about data. *Measurement: Interdisciplinary Research and Perspective, 9*(4), 227–234.

Luo, M. (2008). Structural equation modeling for high school principals' data-driven decision making: An analysis of Information Use Environments. *Educational Administration Quarterly, 44*(5), 603–634.

Wayman, J. C., Cho, V., Jimerson, J. B., & Spikes, D. D. (2012). District-wide effects on data use in the classroom. *Education Policy Analysis Archives, 20*(25), Retrieved from http:/epaa.asu.edu/ojs/article/view/979.

Data expert:

Marsh, J. A., Pane, J. F., Hamilton, L. S. (2006). *Making sense of data-driven decision making in education.* Santa Monica, CA: RAND Education.

Schildkamp, K., & Kuiper, W. (2010). Data-informed curriculum reform: Which data, what purposes, and promoting and hindering factors. *Teaching and Teacher Education, 26*, 482–496.

Wayman, J. C., Cho, V., Jimerson, J. B., & Spikes, D. D. (2012). District-wide effects on data use in the classroom. *Education Policy Analysis Archives, 20*(25), Retrieved from http:/epaa.asu.edu/ojs/article/view/979.

School and district leadership:

Honig, M. I., & Venkateswaran, N. (2012). School-Central office relationships in evidence use: Understanding evidence use as a systems problem. *American Journal of Education, 118*(2), 199–222.

Luo, M. (2008). Structural equation modeling for high school principals' data-driven decision making: An analysis of information use environments. *Educational Administration Quarterly, 44*(5), 603–634.

Marsh, J. A., Farrel, C. C., & McCombs, J. S. (2015). How leaders can support teachers with data-driven decision making: A framework for understanding capacity building. *Educational Management Administration, & Leadership, 43*(2), 269–289.

Schildkamp, K. & Kuiper, W. (2010). Data-informed curriculum reform: Which data, what purposes, and promoting and hindering factors. *Teaching and Teacher Education, 26*, 482–496.

Data use:

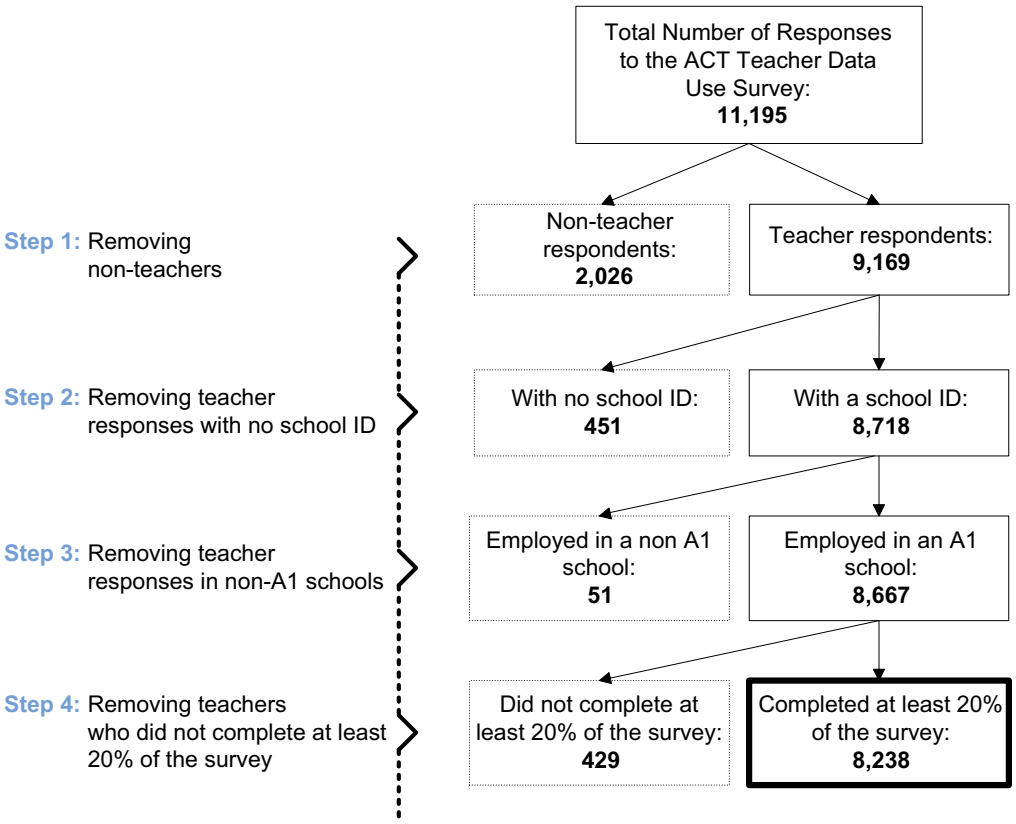
Schildkamp, K. & Kuiper, W. (2010). Data-informed curriculum reform: Which data, what purposes, and promoting and hindering factors. *Teaching and Teacher Education, 26*, 482–496.

Wayman, J. C., Cho, V., Jimerson, J. B., & Spikes, D. D. (2012). District-wide effects on data use in the classroom. *Education Policy Analysis Archives, 20*(25), Retrieved from http:/epaa.asu.edu/ojs/article/view/979.

Appendix A1. Population and Analytical Sample Description

The focus of this research study was to ascertain teachers' perceptions in one Midwestern state of their use of data for decision making, including their confidence in using data, beliefs about the utility of using data, and the support mechanisms in place at the school- and district-levels that aided in that use. As such, the research population included the 41,080[1] classroom teachers employed in principal or head teacher controlled schools (i.e., A1 schools—see Table A1.1).

Figure A1.1 presents the number of teachers who participated in the ACT data use study. A total of 11,195 educators responded to the *ACT Teacher Data Use Survey*, however since the research focus was to understand classroom teachers employed in principal or head teacher controlled schools some data were removed prior to analyses. First, any respondent who self-identified as a non-classroom teacher were removed (n = 2,026). These individuals tended to be librarians, literacy or mathematics coaches employed outside the classroom, or teacher's aides. Second, those teachers who did not have a school ID were removed (n = 451). This occurred when a respondent did not answer the survey questions that asked them from which school and district they were primarily employed. School ID was an important variable in connecting teacher responses with the school and district context.



Note: A1 indicates principal or head teacher controlled schools; dark black boarder box represents the final analytical sample; dotted lined boxes represent the teachers who were removed from the analytical file.

Figure A1.1. Analytical sample

Third, some respondents were employed in organizations that were not principal or head teacher controlled schools. According to the state categorization system,[2] there are nine school classifications, presented in Table A1.1. Any respondent who indicated a school classification that was not A1 was removed from the analytic data file. The 51 teacher responses removed from the analytical sample came from A5 schools (i.e., district operated alternative), A6 schools (i.e., district operated programs in non-district schools), or schools that were not classified.

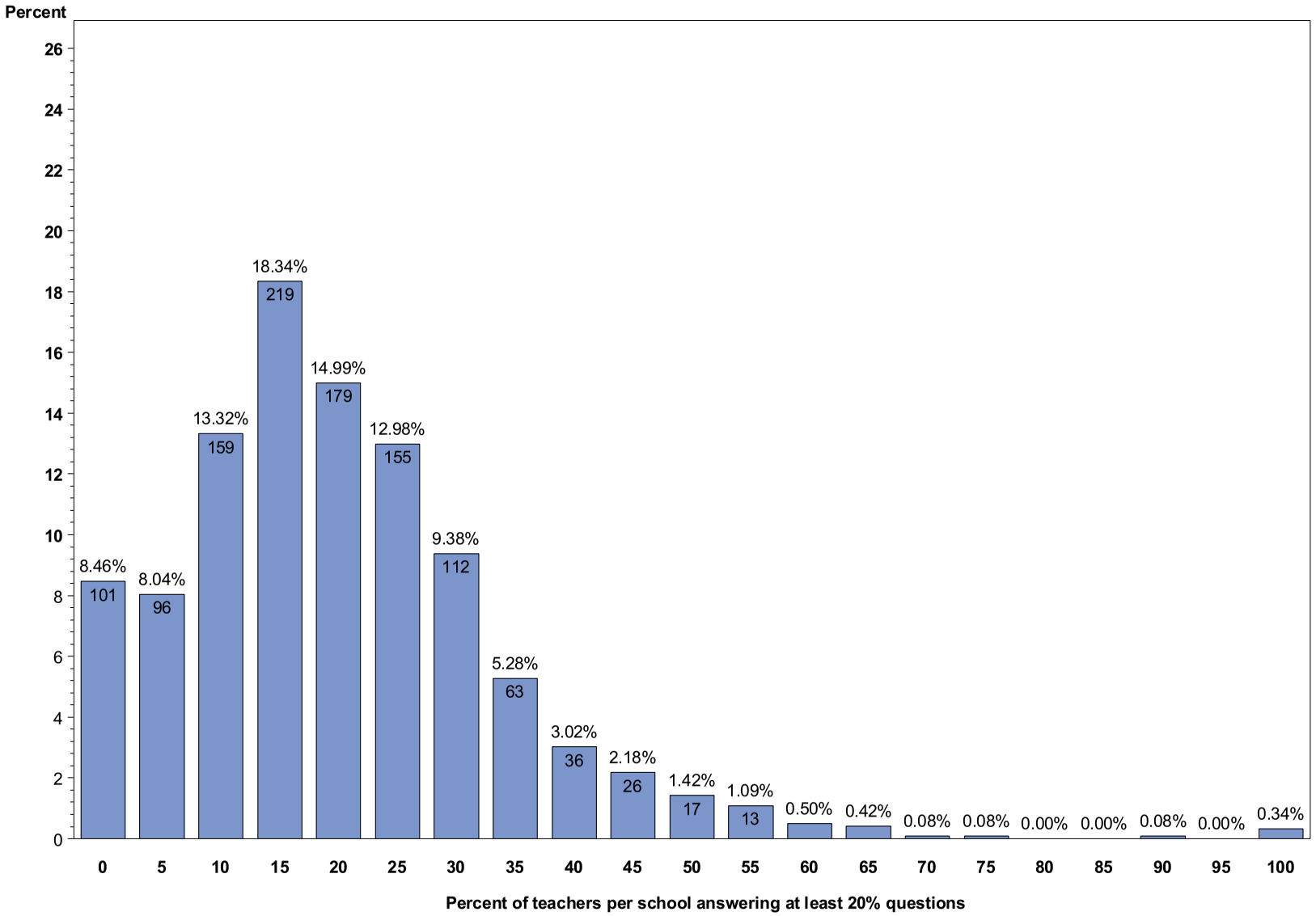
Table A1.1. Department of Education School Classification

Classification	Classification Description
A1	Principal or head teacher controlled school
A2	District operated-vo. tech school
A3	District operated-special ed school
A4	District operated-preschool program
A5	District operated-alternative school
A6	District operated program in non-district school
C1	State operated vocational tech. school
D1	State Dept. of Ed operated (Blind & Deaf)
R1	Private, non-church related

Finally, we wanted to create an analytical sample that included relatively meaningful and coherent data; therefore, any respondent who did not complete at least 20% of the survey was removed (n = 429). In essence, these were individuals who only answered the first few survey items that asked the respondents to describe themselves and the school in which they primarily worked, but they exited the survey prior to providing information on their use of data.

In the end, a total of 8,238 teachers were included in the analytic sample—those survey participants who were included in the reporting of teachers' perceptions of data use in one Midwestern state. This is an estimated response rate of 20%.[3]

Teachers included in the analytic sample came from 1,093 or 92% of A1 schools in the state. Across all A1 schools, approximately seven teachers participated per school, on average. There was, however, a relatively wide range of percentages of teachers participating at the school level. The vast majority of schools (69%; n = 825) had between 7.5% and 32.5% of its teachers responding to the *ACT Teacher Data Use Survey*; a handful of schools had more than 32.5% of its teachers participating (14%; n = 170); and the remaining schools had fewer than 7.5% teacher participation (17%; n = 199). Interestingly, four schools had a 100% teacher participation rate and 101 schools had a 0% teacher participation rate. Figure A1.2 provides the distribution of teacher responses at the school level.



Note: y-axis represents the midpoint; 5% is the midpoint between 2.5% and 7.5%. Each bar includes both the % and number of schools.

Figure A1.2. Teacher response rates by school

Teachers were identified by the type of school in which they were primarily employed. School type was defined by the state school profile[4] and by the following criteria:

Table A1.2. School Type Definition

School Type	Beginning with Grade . . .	Ending with Grade . . .
Primary	Entry/Primary/Preschool	Entry/Primary/Preschool, 1, or 2
Elementary	Entry/Primary/Preschool, 1, 2, 3, or 4	3, 4, 5, or 6
Elementary/Middle	Entry/Primary/Preschool	7 or 8
Middle School	4, 5, 6, 7, or 8	6, 8, or 9
Middle/High School	5, 6, or 7	12
High School	9 or 10	9 or 12
Combined	Entry/Primary/Preschool	12

Teacher participation by school showed similar patterns across school type, although primary schools had the lowest average teacher response rate at nearly 11%, and high schools had the highest average teacher response at nearly 28%. Table A1.3 provides the average teacher response rate by school type.

Table A1.3. Teacher Participation by School Type

School Type	# Teachers Responding	# Possible Teachers	# Schools Responding	# Possible Schools	Average Teacher Response Rate per School
Primary	94	874	22	28	11%
Elementary	3115	18451	576	630	17%
Elementary/Middle School	429	2074	73	79	21%
Middle School	1519	7918	206	224	20%
Middle/High School	148	640	19	20	26%
High School	2828	10689	185	201	28%
Combined	105	431	12	12	25%
All Schools	**8238**	**41080**	**1093**	**1194**	**20%**

Note: The "# Possible Teachers" column represents teachers who had the potential to be a part of the analytic sample (i.e., in A1 schools, with a district/state ID). The "# Teachers Responding" column represents the number actually in the sample.

The variation in teacher participation by school type is primarily due to two factors. First, relative to the other school types, primary schools had a higher percentage of their schools with no teacher responses. Second, there were a higher percentage of high schools, by comparison, that had more than 17.5% of its teachers participating. Figure A1.3 presents the distribution of teacher responses by school for each of the seven school types.

Of the 174 school districts in the state, 168 (97%) districts had at least one teacher respond to the survey. On average, 47 teachers participated per district. Almost two-thirds of the districts (62%) had all their schools represented in the analysis with at least one teacher participating in the survey.

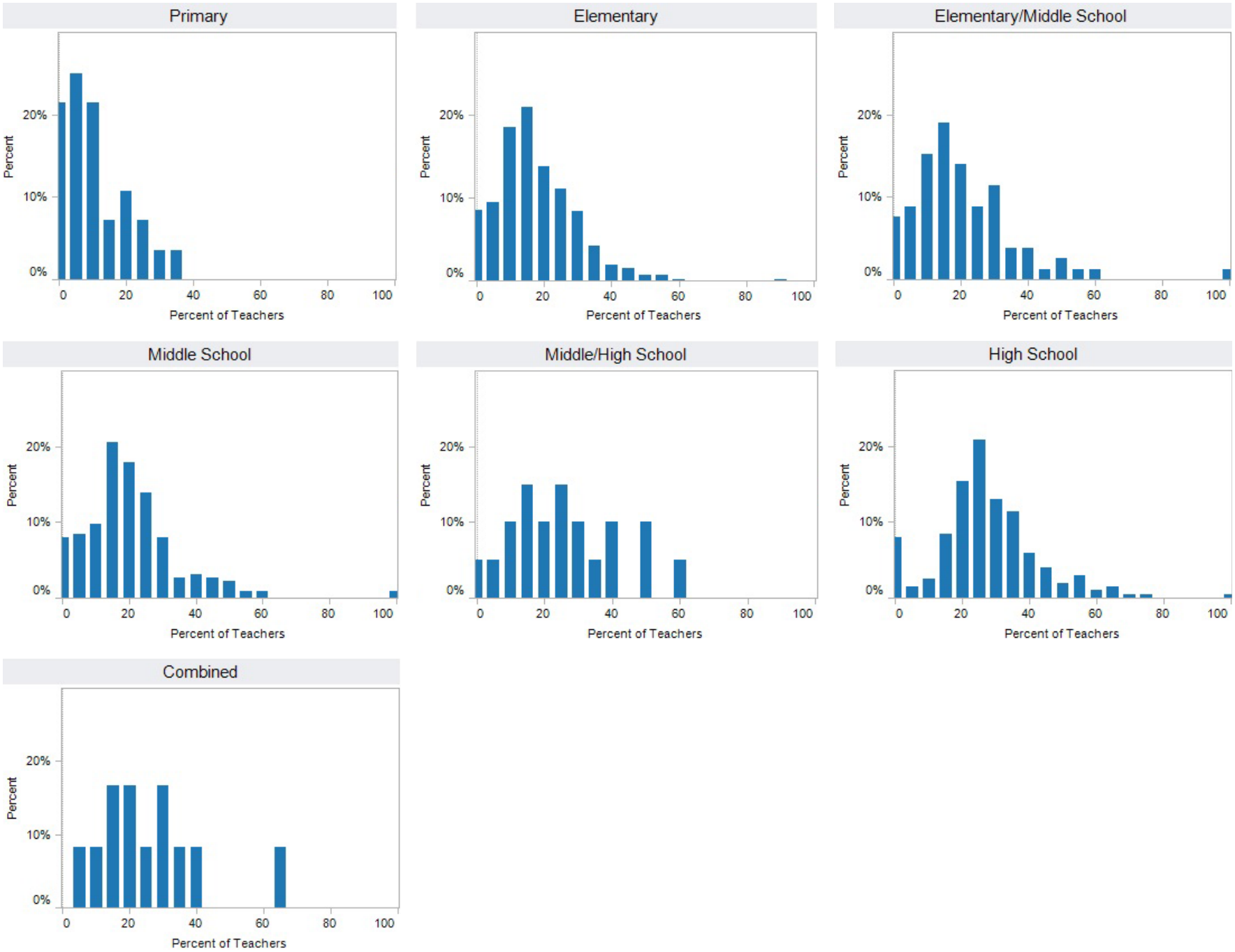


Figure A1.3. Teacher response distribution by school type, across all schools in the state

Appendix A2. Instrument Description

A survey instrument, the *ACT Teacher Data Use Survey,* was used to collect the data for this study. The survey instrument is a comprehensive survey that elicits teachers' perceptions of their use of data for decision making, their confidence in using data, the quality of data available, and the school- and district-level mechanisms in place to support teachers' data use. The instrument itself was constructed by an ACT research team in 2011. Most items originated from pre-existing survey instruments while other items were constructed by the ACT research team. The *Teacher Data Use Survey* is comprised of 17 reliable subscales[5] as well as several other items intended to stand on their own. The survey begins with teaching qualification questions (e.g., grade and subject taught; years of experience) and ends with demographic information (e.g., gender, ethnicity, age).

The instrument was developed through an extensive review of the literature. Emphasis was given to data use studies that utilized a survey research design (e.g., Luo, 2008; Wayman, Cho, Jimerson, & Spikes, 2012)[6] and research reviews summarizing effective data use and the mechanisms that foster that use (e.g., Coburn, & Talbert, 2006; Schildkamp, & Kuiper, 2010; Spillane, 2012).[7] Through this work, the research team first developed a theoretical model of data use (see Figure A2.1) that was then used to identify the key areas that could be measured using a survey. Pre-existing survey items[8] and key concepts, found in the literature and rephrased into survey items, were aligned to the areas in the theoretical model to identify the survey's content coverage. What resulted was a draft teacher data use survey that measured the following areas: interventions to promote data use, data characteristics, data user characteristics, school and district organizational support, and the frequency of data use.[9]

This draft survey was then reviewed by two external experts on data use and four internal ACT staff experts in educational best practices. The reviewers were asked to provide feedback on each survey item for clarity, applicability to the teaching profession, and relevance to the field of data use. Where applicable, modifications were made to the survey item.

The survey was then field-tested through cognitive interviews and a pilot test. The cognitive interview asked teachers to speak out loud as they were answering each survey item. Periodically, the researcher stopped the process to ask specific questions about the respondents' interpretation of the item or scale. Teachers were recruited so as to diversify respondents by years of experience, grade level, subject area, and type of school (i.e., rural, urban, and suburban). This was largely achieved, but recruitment was done by convenience, resulting in an overrepresentation of mathematics teachers.

The goals of the cognitive interviews were to reduce the length of the survey and ensure that items and the scale were being interpreted as intended. This process resulted in a 25% reduction in the survey length and minor edits to the items. We also wanted to identify the types of data (e.g., standardized assessments, grades) that respondents thought of as they answered the survey questions (e.g., how often do you use data to plan lessons) and whether it was necessary for us to provide a list of data types as a way to create continuity in responses. Interview responses showed that respondents varied in how they defined "data" so instructions were also added to the survey requesting that respondents think of these types of data—national and state achievement test data, formal benchmark assessments, grades, disciplinary information—when responding to how data inform their educational practice.

The cognitive interviews were then followed by a pilot test. The pilot test was administered via email to teachers in two small schools (e.g., student population of 400) and two large school districts (e.g., student population of 54,000) in two states. An ACT researcher coordinated with each pilot site to provide them with the invitation to participate in the study. The site coordinator then sent out the invitation and two reminder messages via email. The online survey was open from December 10th, 2012 to January 15, 2013. Once closed, the data were cleaned and psychometric analyses were conducted.

Survey items were developed primarily by the ACT research team, but items from pre-existing surveys were also used.[10] Subscale scores were calculated by averaging across items that comprised the given subscale. Those who answered at least 50% of the items that make up the subscale received a subscale score. Below, we discuss when a subscale was created and when individual items were used. The major areas of the *ACT Teacher Data Use Survey* including sample items, the scale, and reliability results are described next; Table A2.1 summarizes this information. Appendix A3 presents the *ACT Teacher Data Use Survey* in its entirety.

Data Availability. The survey consisted of six major questions associated with the types of data teachers have available to them and how such data are accessed. Respondents were asked to report whether they had access to 20 data elements and, if accessible, their level of usefulness for making decisions about instructional matters. Participants were asked to indicate whether they had access to and found useful, for example, *Student test scores on state-wide assessments* and *School-wide aggregated survey responses from parents*. Accessibility was scored on a dichotomous scale (0 = no; 1 = yes), and usefulness was scored on a five-point scale (1 = not useful; 5 = extremely useful). Data were analyzed at the item level.

Respondents were also asked how often they accessed these data, what percentage of the data was longitudinal, and whether the data were accessible using an electronic data system, and if so, from where was the system accessible. The respondents were then provided an opportunity to respond to an open-ended question asking them to indicate the data they would like to have access to but currently do not. These questions were analyzed at the item level.

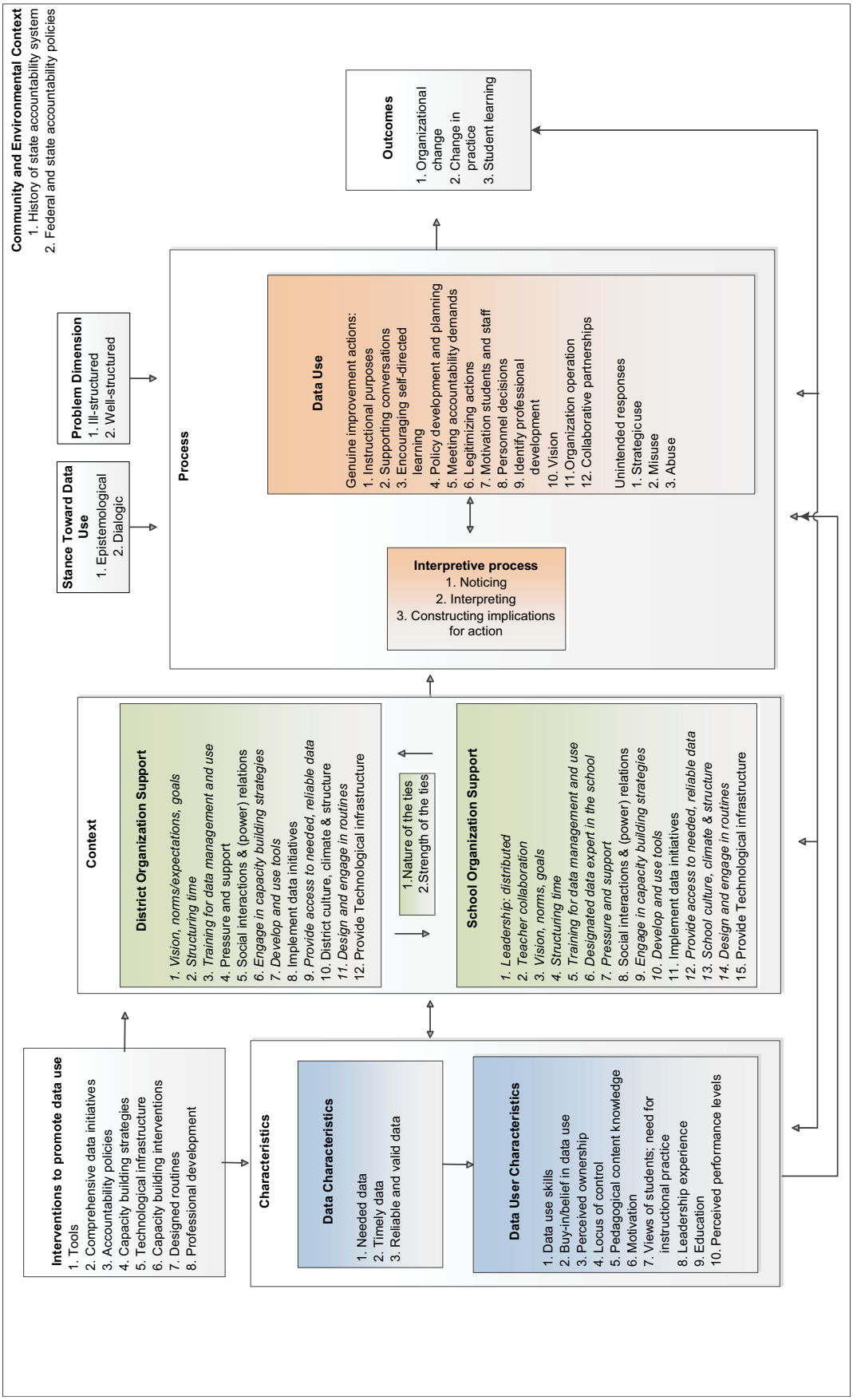


Figure A2.1. Theoretical model of data use

Data Use. These items pertained to four areas in which teachers use data: *instruction* (10 items), *support student's self-directed learning* (5 items), *identify quality educational programs and services* (5 items), and *other uses relevant to teaching* (9 items). This last area asked teachers how often they used data to, for example, engage with the community and parents, or identify quality professional development. Items are self-rated on a seven point scale: 0 = never; 7 = almost daily. Sample items for each of the four areas include:

- *I have used data to adjust my instruction.*
- *I have used data to provide students with behavioral or academic feedback.*
- *I have used data to develop recommendations for tutoring or other educational services for students.*
- *I have used data to keep parents informed about student progress.*

Each survey respondent received a subscale score for instruction, support student's self-directed learning, and identify quality educational programs and services. Other uses relevant to teaching were analyzed at the item level. The ACT research team has found each subscale to have internal consistency. Using the pilot data, *data use for instruction*, *support student's self-directed learning*, and *identify quality educational programs* had a Cronbach's alpha (α) reliability coefficients of 0.96, 0.92, and 0.85, respectively. Reliability coefficients using the data were relatively similar to the pilot data but slightly higher at 0.96, 0.92, and 0.91.

Data Characteristics. Respondents were asked to report on their perceptions of the quality of assessment data. Using 10 items, two areas were measured: perceived *quality of state assessment data* (5 items) and perceived *quality of benchmark assessment data* (5 items). Using a six point scale (1 = strongly disagree; 6 = strongly agree), prompts asked respondents to describe these two types of assessments using the same descriptors. For example, two separate questions asked, one for benchmark data and another for state assessment data, whether these data were applicable to the respondent's work. Each survey respondent received a subscale score for *quality of state assessment data* and perceived *quality of benchmark assessment data*. These subscale scores have internal consistency (pilot: state α = .90, benchmark α = .95; state: α = .88, benchmark α = .92).

Data User Characteristics. Respondents were asked to report on their *beliefs in using data* (7 items) and *confidence in using data* (5 items). A six point, self-rated scale (1 = strongly disagree; 6 = strongly agree) was used. Example items measuring beliefs in using data included *data are almost always useful in helping educators plan instruction*, and *data are almost always useful in improving student learning*. Example items measuring confidence in using data included *I am confident in my ability to adjust my instruction based on data*, and *I am confident in my ability to identify data that best meets my needs*.

Each survey respondent received a subscale score for *beliefs in using data* and *confidence in using data.* These subscale scores have internal consistency (pilot: beliefs α = .97, confidence α = .96; state: beliefs α = .95, confidence α = .92).

Data Use Professional Development. Respondents were first asked whether 11 areas of data use professional development topics were provided to them by their school and/or district. If the professional development was provided, they were then asked to report its usefulness. Using a five point scale (1 = not useful; 5 = extremely useful), example usefulness items included professional development on how to:

- *Use the basic functions of the data system (e.g., accessing and downloading data, data queries).*
- *Interpret data to identify students' instructional levels.*
- *Ask questions about my teaching that can be answered with data.*
- *Use data to set student learning goals.*

Teachers were also asked to report on the impact that these professional development activities, if provided, had on them as professionals (9 items). Using a six point scale (1 = strongly disagree; 6 = strongly agree), example items asked whether the data-related professional development activities teacher participated in this year:

- *Deepened my knowledge of the subject matter I teach.*
- *Improved my skills to use data to inform my instruction.*
- *Improved my skills to meet the instructional needs of all my students.*

These items were analyzed at the item level with an internal consistency of: pilot: usefulness α = .99, impact α = .96; state: usefulness α = .97, impact α = .94.

Data Use Collaboration with Colleagues. Collaboration around data use focused on how frequently teachers worked with colleagues inside the school and across the district on how to effectively use data for decision making (6 items). Respondents were asked, for example, to indicate how frequently in the last year they have *tested lessons or strategies based on student data with other teachers, reviewed data with teachers across schools in my district*, and *reviewed data with teachers in other grades and/or subjects within my school*. A seven point scale was used (1 = never; 7 = almost daily). Data were analyzed at the item level, and reliabilities for the pilot and state samples were high (see Table A2.1).

Data Expert. Teachers were first asked whether the school or district provided a data expert, defined as someone who is knowledgeable about how to use data to inform decision making (e.g., literacy, mathematics or data coach, mentor). Teachers were told that the data expert should be a formal position provided by the district or school. If the teacher indicated that a data expert was provided, they were asked to report on the quality of the services provided by that expert (9 items). For example, teachers were asked the degree to which they could agree that the data expert *is knowledgeable about content and pedagogy* or *has given the teacher useful strategies on how to interpret data*. Data were analyzed at the item level; reliabilities for the pilot and state samples were high.

Data Use Barriers. Teachers were asked the degree to which eight areas were believed to be not a barrier (= 1), a minor barrier (= 2), or a major barrier (= 3) to expanded use of data for decision making in their school. Example reasons included *lack of school staff-preparation on how to use data for instructional decision making (e.g., data interpretation skills)* and *lack of technical skills of school staff to access or use electronic data systems*. Items were analyzed to determine the frequency of teachers who reported the severity of the barrier. As such, when an item had less than 50% of responses indicate the reasons was a minor barrier or a major

barrier it was classified as not a barrier, between 50% to 75% of responses said the reason was a minor barrier or a major barrier it was classified as a minor barrier, and when the reason had greater than 75% of responses saying either a minor barrier or a major barrier it was classified as a major barrier.

Table A2.1. Data Use Subscale Measures

			Cronbach 's alpha		Sample Size	
Data Use Subscale	**# Items**	**Scale**	**Pilot**	**State**	**Pilot**	**State**
Using Data for Instructional Decision Making	10	1 = never 7 = almost daily	.96	.96	88	6174
Data Use to Support Students' Self-Directed Learning	5	1= never 7 = almost daily	.92	.92	82	6150
Data Use to Identify Quality Educational Programs and Services	5	1 = never 7 = almost daily	.85	.85	86	6045
Data Use for Other Teacher Responsibilities	9	1 = never 7 = almost daily	.91	.91	82	5613
Quality of State Assessment Data	5	1 = Strongly Disagree 6 = Strongly Agree	.90	.90	80	5509
Quality of District Benchmark Assessment Data	5	1 = Strongly Disagree 6 = Strongly Agree	.95	.95	84	5330
Beliefs in Data Use	7	1 = Strongly Disagree 6 = Strongly Agree	.97	.97	81	5607
Confidence in Using Data	5	1 = Strongly Disagree 6 = Strongly Agree	.96	.96	80	5654
Usefulness of Data Use Professional Development Provided	11	1 = Not Useful 5 = Extremely Useful	.99	.99	34	455
Impact of Provided Data Use Professional Development	9	1 = Strongly Disagree 6 = Strongly Agree	.96	.96	61	2527
Usefulness of Policies Provided	4	1 = Not Useful 5 = Extremely Useful	.95	.95	23	965
Data Use Collaboration with Colleagues	6	1 = never 7 = almost daily	.93	.93	68	4591
Data Expert Support	9	1 = Strongly Disagree 6 = Strongly Agree	.94	.94	44	3217
School Administrators' Leadership in Data Use	14	1 = Strongly Disagree 6 = Strongly Agree	.97	.97	135	5038
Culture of Data Use by School Administrators	4	1 = Strongly Disagree 6 = Strongly Agree	.98	.98	135	4652
Culture of Data Use by District Administrators	4	1 = Strongly Disagree 6 = Strongly Agree	.97	.97	120	4858
Barriers to Data Use	8	1 = Not a Barrier 3 = Major Barrier	.91	.91	73	4720

Appendix A3. ACT's Teacher Data Use Survey

Background

1. Are you a classroom teacher?

A "classroom teacher" includes teachers with direct responsibilities for teaching students, for example, teachers of academic and/or elective courses, special education teachers, resource teachers, and ESL teachers. This does not include teacher aides, student teachers, long- or short-term substitutes, paraprofessionals, full-time coaches (e.g., literacy, instructional, data), and other non-teaching professionals such as nurses or guidance counselors.

- ○ Yes, I am a *full-time* classroom teacher.
- ○ Yes, I am a *part-time* classroom teacher (i.e., I do not have a full teaching load).
- ○ No, I am not a classroom teacher. **You have indicated that you are not a classroom teacher. What is your title?** _____ →*Then skip to Question 6 [survey concludes after question 9].*

2. Are you a classroom teacher at more than one school in the district?

- ○ No
- ○ Yes *(When completing this survey, please refer to your experiences at the school in which you received this survey.)*

3. What grade levels and subject areas do you teach at this school this year? Select all that apply.

a. Grade Levels

- ○ K
- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5
- ○ 6
- ○ 7
- ○ 8
- ○ 9
- ○ 10
- ○ 11
- ○ 12
- ○ ungraded

b. Subjects

- ○ General Elementary
- ○ English/Language Arts/Reading
- ○ Journalism/Speech/Communication
- ○ Computer Science
- ○ Foreign Language
- ○ Engineering
- ○ Health/Physical Education
- ○ Mathematics
- ○ Science
- ○ History/Social Studies
- ○ Special Education
- ○ Bilingual/ELL/ESL/ESOL
- ○ Fine Arts (Music, Theatre, Art, Dance)
- ○ Other (please specify)

_____

4. How many years have you been a teacher, including this year?
(Fill in each space with zero or another number.)

in total? _____

in this district? _____

at this school? _____

5. What types of classes are you teaching this year? Select all that apply.

- ○ Gifted and Talented
- ○ Honors/ Advanced Placement/IB
- ○ Traditional/Regular/Standard
- ○ Special Education
- ○ Remedial
- ○ Classes designed for ELL/ESOL students

6. What is the name of the school in which you received this survey?

_____

7. In which district is this school located?

_____

8. What grades are offered at the school in which you received this survey? Select all that apply.

○ K ○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ○ 6 ○ 7 ○ 8 ○ 9 ○ 10 ○ 11 ○ 12

9. Which, if any, of the following positions have you held this year? Select all that apply.

- ○ Department head, lead or chair
- ○ Member of a school-wide committee or task force
- ○ Member of a district-wide committee or task force
- ○ Grade-level head, lead or chair
- ○ Union representative
- ○ Professional development workshop leader/instructor
- ○ Instructional coach (e.g., data coach)
- ○ Mentor teacher
- ○ None of the above
- ○ Other (please specify) _____

Data Availability

In this section, please respond to questions about the data you have available to you.

10. Do you have access to any of the following types of data? Please indicate whether each data source is currently available to you. If available, indicate how useful each source of data was to you for making decisions about instructional matters.

	Data availability:		Level of usefulness for decision making				
	No	Yes	Not useful	Minimally useful	Some-what useful	Very useful	Extremely useful
a. Student test scores on **state-wide assessments**.	O	O	O	O	O	O	O
b. Student test scores on **state-wide assessments disaggregated by subtopics** or **skills**.	O	O	O	O	O	O	O
c. Student test scores on **district-administered assessments** (e.g., benchmark assessments).	O	O	O	O	O	O	O
d. Student test scores on **district-administered assessments disaggregated by subtopics** or **skills**.	O	O	O	O	O	O	O
e. Student performance on **school-administered assessments** (e.g., end of unit tests, classroom quizzes, homework).	O	O	O	O	O	O	O
f. Student test scores on **nationally normed assessments** (e.g., Stanford 9, ACT, SAT, PSAT).	O	O	O	O	O	O	O
g. Student special education information (e.g., diagnostic data).	O	O	O	O	O	O	O
h. Student behavior data (e.g., counselor reports, referrals, discipline).	O	O	O	O	O	O	O
i. Student grades.	O	O	O	O	O	O	O
j. Student course enrollment histories.	O	O	O	O	O	O	O
k. Student participation in educational programs (e.g., ELL, Title I, gifted and talented, special education).	O	O	O	O	O	O	O
l. Student participation in supplementary education programs (e.g., tutoring).	O	O	O	O	O	O	O
m. Student retention histories.	O	O	O	O	O	O	O
n. Student attendance histories.	O	O	O	O	O	O	O
o. Data obtained from classroom walkthroughs.	O	O	O	O	O	O	O
p. Results obtained from a systematic review of student work (e.g., portfolio or other student work evaluated using a rubric).	O	O	O	O	O	O	O
q. **School-wide** aggregated survey responses from students.	O	O	O	O	O	O	O
r. **School-wide** aggregated survey responses from parents.	O	O	O	O	O	O	O
s. School-wide aggregated survey responses from teachers.	O	O	O	O	O	O	O
t. Other data not mentioned above. **Please specify in the space below.** _____ _____	O	O	O	O	O	O	O

11. In a typical month, how often do you access data through the following?

	Less than once a month	Once or twice a month	Weekly or almost weekly	A few times a week	Not applicable
a. Personally accessing data from a computer system.	O	O	O	O	O
b. Requesting data from someone in my school or district.	O	O	O	O	O
c. Someone in my school or district gives me data without me asking.	O	O	O	O	O

12. By your estimate, what percentage of the data that you currently have is available for multiple years?

- ○ Less than 25%
- ○ 25% but less than 50%
- ○ 50% but less than 75%
- ○ 75% or more
- ○ Don't know

13. Do you have access to an electronic data system?

- ○ No
- ○ Yes

14. Do you currently have access to an electronic data system in any of the following locations? *(If no electronic data system is accessible, please skip this section.)*

I have access to an electronic data system . . .	No	Yes	Don't know
a. in my own classroom or office.	O	O	O
b. somewhere else in the school.	O	O	O
c. via the Internet at my home.	O	O	O

15. What data would you like to have that you do not currently have access to?

_____

The remainder of this survey asks about the use of specific types of data to inform your educational practice. Please consider only the following when you think of data:

- National and state achievement test data (e.g., Stanford 9, AIMS, KPREP, ACT, SAT)
- Formal assessments (e.g., district benchmarks)
- School assessments (e.g., quizzes, grades, assignments)
- Other student data (e.g., disciplinary information, ELL status, supplementary education participation, student retention)
- Other data (e.g., survey data, classroom walkthrough data)

Data Use

In this section, please indicate the frequency in which you use data to inform your work as a teacher.

16. How often in this current academic year (including last summer) have you used data to inform your instruction?

	Never	Once a year	A few times a year	Once a month	2–3 times a month	At least once a week	Almost daily
a. I have used data to adjust my instruction.	O	O	O	O	O	O	O
b. I have used data to plan lessons.	O	O	O	O	O	O	O
c. I have used data to identify learning needs of students who are struggling.	O	O	O	O	O	O	O
d. I have used data to identify learning needs of students who are not struggling.	O	O	O	O	O	O	O
e. I have used data to set learning goals for individual students.	O	O	O	O	O	O	O
f. I have used data to tailor instruction to individual student needs.	O	O	O	O	O	O	O
g. I have used data to form small groups of students for targeted instruction.	O	O	O	O	O	O	O
h. I have used data to identify instructional content to use in class.	O	O	O	O	O	O	O
i. I have used data to evaluate promising classroom practices.	O	O	O	O	O	O	O
j. I have used data to determine whether I need to reteach particular concepts and skills.	O	O	O	O	O	O	O

17. How often in this current academic year (including last summer) have you used data to support students' self-directed learning?

	Never	Once a year	A few times a year	Once a month	2–3 times a month	At least once a week	Almost daily
a. I have used data to provide students with behavioral or academic feedback.	O	O	O	O	O	O	O
b. I have used data to engage students in data analysis strategies.	O	O	O	O	O	O	O
c. I have used data to guide students in goal setting.	O	O	O	O	O	O	O
d. I have used data to guide students in monitoring their own progress.	O	O	O	O	O	O	O
e. I have used data to assist students in identifying their strengths or weaknesses.	O	O	O	O	O	O	O

18. How often in this current academic year (including last summer) have you used data to identify quality educational programs and services?

	Never	Once a year	A few times a year	Once a month	2–3 times a month	At least once a week	Almost daily
a. I have used data to develop recommendations for tutoring or other educational services for students.	O	O	O	O	O	O	O
b. I have used data to evaluate curricular programs.	O	O	O	O	O	O	O
c. I have used data to develop recommendations for student intervention.	O	O	O	O	O	O	O
d. I have used data to determine whether specific programs lead to improved achievement.	O	O	O	O	O	O	O
e. I have used data to inform student placement into courses or special programs.	O	O	O	O	O	O	O

19. How often in this current academic year (including last summer) have you used other data relevant to your teaching (e.g., engage with the community and parents; identify quality professional development)?

	Never	Once a year	A few times a year	Once a month	2–3 times a month	At least once a week	Almost daily
a. I have used data to keep parents inform about student progress.	O	O	O	O	O	O	O
b. I have used data to select which parents to contact (e.g., students who are performing below grade level).	O	O	O	O	O	O	O
c. I have used data to understand the larger context of the community which affects opportunities for students.	O	O	O	O	O	O	O
d. I have used data to propose ideas for improving school-community relations.	O	O	O	O	O	O	O
e. I have used data to decide whether to give my students test-taking practice (e.g., strategies, practice tests).	O	O	O	O	O	O	O
f. I have used data to assess learning equity for different student populations.	O	O	O	O	O	O	O
g. I have used data to identify areas for professional development.	O	O	O	O	O	O	O
h. I have used data to evaluate the effectiveness of professional development provided to me.	O	O	O	O	O	O	O
i. I have used data to reflect on my own teaching practices.	O	O	O	O	O	O	O

Data Characteristics & Data User Characteristics

The next set of questions asks about your perception of the quality of specific types of data. Additional questions ask about your skill set in using data

20. These items are about your perception of the quality of state assessment data to which you have access. To what extent do you agree or disagree with the following statements? *(If no state assessment data are available for your grade or subject, please skip this section.)*

The state data I have available to me are . . .	Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree
a. applicable to my work.	O	O	O	O	O	O
b. easy to interpret.	O	O	O	O	O	O
c. good measures of student learning.	O	O	O	O	O	O
d. easily accessible when needed.	O	O	O	O	O	O
e. aligned well to curriculum standards.	O	O	O	O	O	O

21. These items are about your perception of the quality of district-provided benchmark assessment data to which you have access. To what extent do you agree or disagree with the following statements? *(If no benchmark assessment data are available for your grade or subject, please skip this section.)*

The benchmark data I have available to me are . . .	Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree
a. applicable to my work.	O	O	O	O	O	O
b. easy to interpret.	O	O	O	O	O	O
c. good measures of student learning.	O	O	O	O	O	O
d. easily accessible when needed.	O	O	O	O	O	O
e. aligned well to curriculum standards.	O	O	O	O	O	O

22. These items are about your attitudes and opinions regarding data. Please indicate how much you agree or disagree with the following statements..

Data are almost always useful in . . .	Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree
a. helping educators plan instruction.	O	O	O	O	O	O
b. offering information about students that was not already known.	O	O	O	O	O	O
c. improving student learning.	O	O	O	O	O	O
d. helping evaluate the quality of instruction.	O	O	O	O	O	O
e. informing progress in the school improvement plan.	O	O	O	O	O	O
f. helping determine if a program is effective.	O	O	O	O	O	O
g. guiding conversations with parents.	O	O	O	O	O	O

23. These items are about your attitudes toward your own use of data. Please indicate how much you agree or disagree with the following statements.

I am confident in my ability to . . .	Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree
a. adjust my instruction based on data.	O	O	O	O	O	O
b. identify data that best meets my needs.	O	O	O	O	O	O
c. synthesize multiple measures when using data to make decisions.	O	O	O	O	O	O
d. draw correct inferences from data.	O	O	O	O	O	O
e. use technology to manipulate data.	O	O	O	O	O	O

Professional Development & Support

Now think about the school- or district-sponsored activities to support your professional growth and development. In this survey, professional development is defined as activities that develop an individual's skills, knowledge, expertise and other characteristics as a teacher.

24. First, please indicate if the school- or district-sponsored professional development activity was provided during this academic year (including last summer) and by whom. If provided, please indicate the degree to which the professional development activity was useful.

		If provided, how useful was it?				
Professional development on how to . . .	**Provided**	**Not useful**	**Minimally useful**	**Somewhat useful**	**Very useful**	**Extremely useful**
a. use the basic functions of the data system (e.g., accessing and downloading data, data queries).	O	O	O	O	O	O
b. interpret data to identify students' instructional levels.	O	O	O	O	O	O
c. use data to change instructional practices (e.g., tools for translating data into practice).	O	O	O	O	O	O
d. use data to set student learning goals.	O	O	O	O	O	O
e. identify data that best meets my needs.	O	O	O	O	O	O
f. ask questions about my teaching that can be answered with data.	O	O	O	O	O	O
g. synthesize multiple measures when using data to make decisions..	O	O	O	O	O	O
h. identify quality data.	O	O	O	O	O	O
i. use data to plan lessons.	O	O	O	O	O	O
j. familiarize students with the state test format and test-taking strategies.	O	O	O	O	O	O
k. teach students to interpret and use data to monitor their progress.	O	O	O	O	O	O

25. Approximately how many total hours during this academic year (including last summer) did you spend in any school- or district-sponsored professional development focused on training you to effectively use data for decision making?
(If you indicated in the previous item that no professional development activities were provided by your school or district, please skip this question.)

○ Less than 4 hours ○ 4–8 hours ○ 9–16 hours ○ 17–24 hours ○ More than 24 hours

26. Please indicate the extent to which you agree or disagree with the following statements about any school- or district-sponsored professional development data related activities in which you participated in the current school year (including last summer). *(If no professional development activities were provided by your school or district, please skip this section.)*

Overall, the data-related professional development activities I participated in this year . . .	Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree
a. deepened my knowledge of the subject matter I teach.	O	O	O	O	O	O
b. improved my skills to use data to inform my instruction.	O	O	O	O	O	O
c. increased my ability to use data effectively.	O	O	O	O	O	O
d. helped me to better identify quality data.	O	O	O	O	O	O
e. were developed with teacher input.	O	O	O	O	O	O
f. were designed or chosen to support the school's improvement goals.	O	O	O	O	O	O
g. were designed or chosen to support the implementation of district-wide initiatives.	O	O	O	O	O	O
h. were topics identified based on student data.	O	O	O	O	O	O
i. improved my skills to meet the instructional needs of all my students.	O	O	O	O	O	O

27. First, please indicate if the following school- or district-support was provided during this academic year (including last summer) was provided and by whom. If provided, please indicate the degree to which the activity was useful.

		If provided, how useful was it?				
	Provided	Not useful	Minimally useful	Somewhat useful	Very useful	Extremely useful
a. District created policies that indicate when teachers should work with data (e.g., certain number of days per week).	O	O	O	O	O	O
b. School created policies that indicate when teachers should work with data (e.g., certain number of days per week).	O	O	O	O	O	O
c. District created policies that indicate what should occur during time dedicated to using data (e.g., guidance on key problems to work on).	O	O	O	O	O	O
d. School created policies that indicate what should occur during time dedicated to using data (e.g., guidance on key problems to work on).	O	O	O	O	O	O

28. During the current school year (including last summer), how many times did you engage in the following types of activities?

	Never	Once a year	A few times a year	Once a month	2–3 times a month	At least once a week	Almost daily
a. Testing lessons or strategies based on student data with other teachers.	O	O	O	O	O	O	O
b. Refining lessons or strategies based on student data with other teachers.	O	O	O	O	O	O	O
c. Reviewing data with teachers across schools in my district.	O	O	O	O	O	O	O
d. Reviewing data with teachers in other grades and/or subjects within my school.	O	O	O	O	O	O	O
e. Collaborating with my principal using data.	O	O	O	O	O	O	O
f. Interacting with your principal about how to data use.	O	O	O	O	O	O	O
g. Collaborating with district administrators using data.	O	O	O	O	O	O	O
h. Receiving feedback from a teacher who observed my class after I changed my instruction based on data.	O	O	O	O	O	O	O
i. Participating in classroom walkthroughs at my school.	O	O	O	O	O	O	O
j. Participating in classroom walkthroughs at other schools in my district.	O	O	O	O	O	O	O
k. Participating in a formal coaching or mentoring relationship with another teacher or staff member who helps me to better use data.	O	O	O	O	O	O	O
l. Reviewing data by myself.	O	O	O	O	O	O	O
m. Working with the electronic data system.	O	O	O	O	O	O	O

Now think about the support provided to you by a data expert(s) at your school or district. A data expert is someone who is knowledgeable about how to use data to inform decision-making (e.g., literacy, mathematics or data coach, mentor). This is a person in a formal position provided by the district or school.

29. Does your school or district currently have a data expert?

- ○ No
- ○ Yes

30. Please indicate the extent to which you agree or disagree with each of the following statements about the data expert in your school or district. If you have more than one data expert, please respond regarding the person you work most closely with. *(If no school or district data expert was provided, please skip this section.)*

The data expert . . .	Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree
a. is knowledgeable about content and pedagogy.	O	O	O	O	O	O
b. helps me access the data I need.	O	O	O	O	O	O
c. has given me useful strategies on how to interpret data.	O	O	O	O	O	O
d. helps me address the needs of individual students by connecting data to practice.	O	O	O	O	O	O
e. models effective techniques on how to adjust instruction based on data.	O	O	O	O	O	O
f. encourages my use of data for decision making.	O	O	O	O	O	O
g. provides me with formal feedback on my data use.	O	O	O	O	O	O
h. provides procedures to guide my use of data.	O	O	O	O	O	O
i. works with me individually on a regular basis.	O	O	O	O	O	O

Leadership

This section asks about administrators' efforts to build capacity at the school level to support using data to improve instruction.

31. Please indicate the extent to which you agree or disagree with the following statements about your school administrators' (including those of your principal or assistant principal) role this academic year (including last summer) in supporting data use for teachers' decision making and planning.

Administrators in my school (including your principal or assistant principal) . . .	Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree
a. provide a clear direction about how data should be used to improve instruction.	O	O	O	O	O	O
b. convey enthusiasm about data-informed decision making to staff at my school.	O	O	O	O	O	O
c. clearly communicate that data-informed decision making is fundamental to my work.	O	O	O	O	O	O
d. focus on continuous inquiry, learning and improvement based on data.	O	O	O	O	O	O
e. create many opportunities for me to use data.	O	O	O	O	O	O
f. are good examples of effective data users.	O	O	O	O	O	O
g. discuss data with me.	O	O	O	O	O	O
h. model effective techniques for interpreting and acting on data.	O	O	O	O	O	O
i. provide me with formal feedback on my data use.	O	O	O	O	O	O
j. scaffold my learning about using data.	O	O	O	O	O	O
k. observe me while I implement a data-informed strategy in my classroom.	O	O	O	O	O	O
l. monitor how I engage with data.	O	O	O	O	O	O
m. lead discussions on the meaning of data.	O	O	O	O	O	O
n. develop data reports tailored to my specific requests for information.	O	O	O	O	O	O

Administrators in my school (including your principal or assistant principal) . . .	Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree
o. are responsive when I have specific questions about student achievement data.	O	O	O	O	O	O
p. provide important procedures to guide my use of data.	O	O	O	O	O	O
q. structure time for me to collaborate with other teachers around data use.	O	O	O	O	O	O
r. work with small groups of teachers to analyze student test results.	O	O	O	O	O	O

32. Please indicate the extent to which you agree or disagree with the following statements about your district administrator's role this academic year (including last summer) in supporting data use for teachers' decision making and planning.

District administrators . . .	Strongly Disagree	Moderately Disagree	Slightly Disagree	Slightly Agree	Moderately Agree	Strongly Agree
a. provide a clear direction about how data should be used to improve instruction.	O	O	O	O	O	O
b. convey enthusiasm about data-informed decision making to staff at my school.	O	O	O	O	O	O
c. clearly communicate that data-informed decision making is fundamental to my work.	O	O	O	O	O	O
d. focus on continuous inquiry, learning and improvement based on data.	O	O	O	O	O	O

33. To what extent, if any, is each of the following issues a barrier to the expanded use of data-informed decision making in your school?

	Not a Barrier	Minor Barrier	Major Barrier
a. Lack of school staff preparation on how to use data for instructional decision making (e.g., data interpretation skills).	O	O	O
b. Lack of technical skills of school staff to access or use electronic data systems.	O	O	O
c. Lack of time for school staff to conduct data-informed decision making activities (e.g., to reflect on or use data for teacher collaboration).	O	O	O
d. Lack of district leadership support for data-informed decision making (e.g., explicit norms and expectations regarding data use).	O	O	O
e. Lack of communication or sharing of data across departments within the district.	O	O	O
f. Lack of policies that provide direct access by school staff to all or portions of the data system.	O	O	O
g. Lack of an electronic data system.	O	O	O
h. Lack of student performance data in specific subject areas	O	O	O

Demographic Information

In closing, we would like to ask a few questions to help us determine if we surveyed a representative sample of educators.

34. Are you . . .

- ○ Male
- ○ Female

35. What is your age range in years?

- ○ Under 25
- ○ 25–29
- ○ 30–39
- ○ 40–49
- ○ 50–59
- ○ 60+

36. How do you describe yourself?

- ○ American Indian
- ○ Asian
- ○ African American
- ○ Hispanic
- ○ Pacific Islander
- ○ White
- ○ Other _____

37. What is the highest degree you hold?

- ○ Associate degree
- ○ Bachelor's degree
- ○ Master's degree
- ○ Doctorate or first professional degree
- ○ Do not have a degree beyond a high school diploma

38. Please use the space below to provide any comments concerning this survey or the use of data for decision making.

_____

_____

_____

Thank you for your participation. We appreciate your help!

Appendix A4. Data Collection

The *ACT Teacher Data Use Survey* was an online survey powered by Vovici software. To ensure a maximum level of participation, we took a two-pronged approach to encourage teacher participation. First, teachers were recruited to participate indirectly through school and district administrators. Using a comprehensive list of principal and superintendent contact information on the states website,[11] administrators were both emailed and sent letters via the U.S. mail requesting they inform teachers of the study. Second, teachers were directly contacted via email through the Department of Education's Teacher listserv. Here, an ACT researcher provided the Director of Communications with the email message who then placed the message in the teachers' weekly e-newsletter. What follows is a more detailed description of the teacher recruitment and data collection process; Table A4.1 summaries this process in detail.

Notifications and data collection occurred between January and March 2013. This timeframe was chosen to avoid the state's standardized assessment window (March/April). In addition, we wanted to avoid the end of the academic year (May/June) when other surveys were being administered and when educators were focused on closing out the school year.

Starting at the end of January, the state's superintendents and principals were sent a pre-notification message explaining that ACT was looking for teachers in the state to participate in the *ACT Teacher Data Use Survey*. These notifications described the purpose of the study, encouraged administrators to inform teachers of the opportunity to participate in a survey, and asked administrators to endorse the research. Administrators were also asked to forward the survey link to teachers, once we provided the link. Two pre-notification messages were sent, one via email and one through the U.S. mail. Using the state teacher listserv, teachers were sent an email describing the research study, the benefits of participating, and the timeframe for participation.

In February, teachers were sent an email invitation to the survey. The message re-iterated the research focus, the importance of participating, and how the results would be used. The email also provided the survey link, instructions on how to log into the survey, and assurances that responses were anonymous. Superintendents and principals were provided a letter via the U.S. mail a week later with similar messaging.

Teachers, via the state's teacher listerv, were sent two reminder messages, one in February and another a month later. We wanted to provide enough time for the principals and superintendents to communicate to teachers their endorsement of the study prior to sending out our last reminder message. In addition, we wanted to honor the Department of Education's request to limit the number of notifications sent. The survey closed on March 31st. Data were then exported from Vovici into an Excel file for data cleaning and analysis.

Table A4.1. Data Collection Process

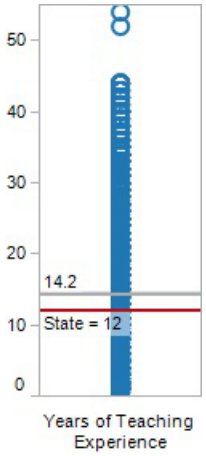
Date	Method	Description	Message Sent to:		
			Teacher	Principal	Superintendent
1/24/13	Email	A message was sent describing the purpose of the research and requesting the assistance of administers to recruit teachers for participation.		X	X
2/4/13	Email	A pre-notification message was sent describing the purpose of the research and explaining that a survey link was forthcoming.	X		
2/7/13	U.S. Mail	A second pre-notification message was sent describing the purpose of the research and requesting assistance to encourage teacher participation.		X	X
2/13/13	Email	An invitation asking for participation in the survey, including the online survey link.	X		
2/19/13	Email	A reminder note was sent encouraging non-participants to complete the survey by the due date and thanking participants for already completing the survey.	X		
2/20/13	U.S. Mail	An invitation asking for participation in the survey, including the online survey link, and for encouraging administrators to pass the survey link and research description to teachers.		X	X
3/25/13	Email	A second reminder note was sent encouraging non-participants to complete the survey by the due date and thanking participants for already completing the survey.	X		

Appendix A5. Data Analysis

Preliminary analyses are addressed first; analyses specific to the results presented in the executive summary are addressed second. Four sets of preliminary analyses were conducted. First, since the results are intended to be generalized to teachers employed in A1 schools, analyses were conducted to determine if respondents were similar to the statewide teacher population. Second, item non-response analyses were conducted to determine if data were missing at random. Simple descriptive statistics were conducted to determine the amount of missing data. Third, a measure of internal consistency was used to determine reliability estimates for key constructs measured in the survey. Fourth, a series of analyses of variances were conducted to determine if some of the seven school categories could be consolidated.

Analyses of data presented in the executive summary were primarily descriptive in nature (e.g., frequencies, means, and standard deviations), but ANOVA's were conducted when the primary interest was to determine to what degree school level (elementary, middle school, high school) were different on key survey measures. We elaborate in more detail on all of these analyses next.

Representativeness of respondents. One of the major issues to survey research is the non-response bias that occurs when some respondents complete the instrument while others do not (Fowler, 1993).[12] To determine if our analytical sample looked like teachers across the state,[13] we compared the two groups on key demographic characteristics (see Figures A5.1 and A5.2 for summarized results).



Note: The red line represents the state percentage of male principals. The grey bar represents the confidence interval around the estimated percentage of male principals responding to the survey.

Figure A5.1. Years of experience

The results showed that, in comparison to the state, teachers who respondent to the survey, on average:

- have slightly more years of experience (14.2 years vs. 12 years at the state),
- are slightly more likely to be female (80.3%, vs. 78% at the state),
- are less likely to have earned a bachelor's degree (12.4% vs. 17% at the state), and
- are much more likely to have a master's degree or a doctorate degree (74.3% vs. 52% with a master's degree; 13.1% vs. 0.4% with doctorate degree).

Although survey respondents looked similar to the state demographics on years of experience and gender composition, there were differences in degree attainment. Differences in degree attainment might be an issue since individuals with higher degrees could value professional development and data use more so relative to those teachers who have only a bachelor's degree, although no past research has shown this to be true. We, therefore, caution the reader in generalizing the survey results to all teachers in the state.

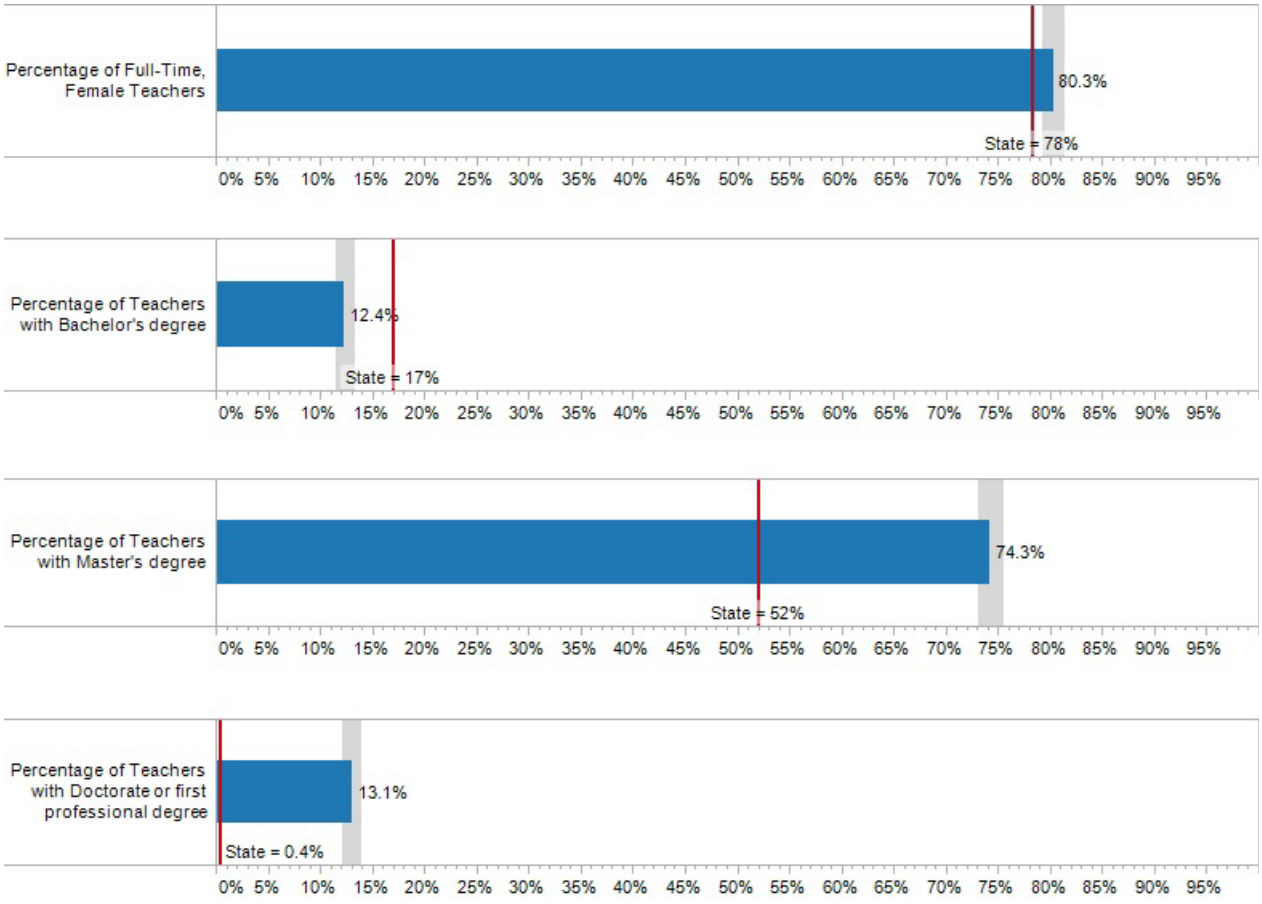


Figure A5.2. State level vs. analytic sample comparisons on key demographic information

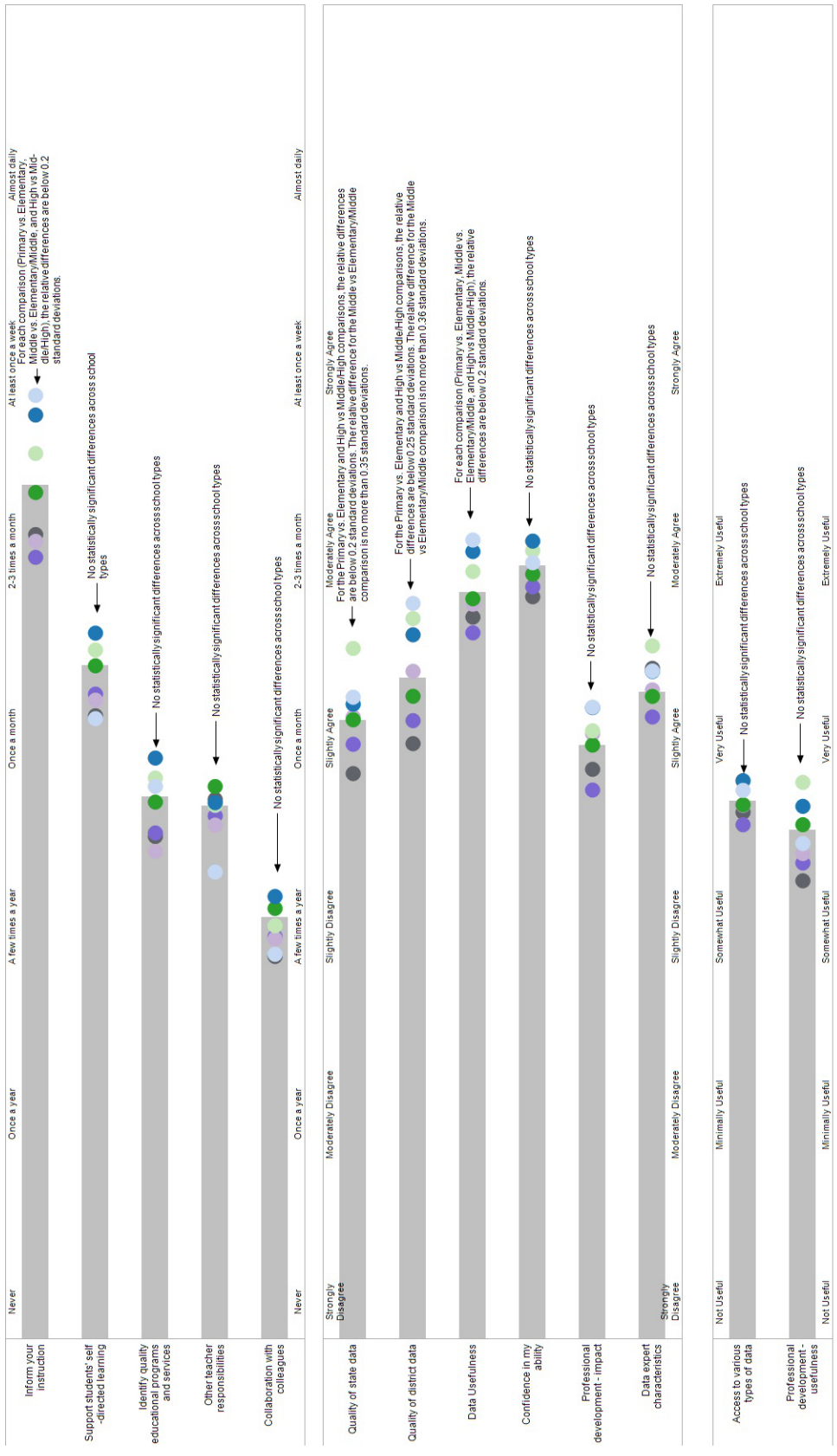
Missing data. Item non-response is an additional survey research concern. To address concerns about missing data, the data were analyzed to determine the severity of the problem (i.e., how many respondents refused to answer each question) and to see if there were any obvious pattern for their omission. Although the amount of missing data towards the beginning of the survey was minimal, a drop-off in participation occurred towards the end of the survey. Missing data were treated as missing in all subsequent analyses; the executive summary omits results that pertain to the survey that had large amounts of missing data.

Consistency of items within constructs. To ensure that the items in the survey had internal consistency, a series of Cronbach's alpha were employed. Here, each theoretically developed set of questions were analyzed to determine if the scores generated from these items were reliable (e.g., hung together). We considered a standardized alpha coefficient above .80 as an indication that scores were reliable. Further, we looked at whether removing an item would improve the overall reliability estimate for the construct under analysis. If an item reduced the reliability estimate by .10 points, the item was removed and not used in this report.

Number of school categories. We conducted a series of analysis of variances (ANOVAs) to determine if it was feasible to reduce the number of school level categories (e.g., primary, elementary, elementary/middle, middle, middle/high, high, and combined). A reduction in the number of groups was important for two reasons. First, we wanted to create groups that had similar sample sizes for questions regarding whether differences in school level were present. Second, we wanted to have group comparisons that were more manageable to present to practitioners. Third, we wanted each group to represent a common school environment. Two sets of analyses were conducted. ANOVA's were first run to determine if there were statistical differences across the groups on key constructs measured in the survey. The results showed that primary teachers and elementary teachers reported similar results; teachers in the middle schools looked similar to teachers who taught in the combined elementary/middle schools, and high school teachers had similar survey responses relative to those housed in middle/high schools. This justified collapsing categories into elementary (with primary teacher responses included), middle (with elementary/middle teachers included), and high school (with middle/high school responses included). Those teachers who were in schools that taught all grades were removed. To ensure that this was the best decision, a second set of analyses were conducted. Here, ANOVAs were run two separate ways; one set of ANOVAs removed the 'combined' group and collapsed elementary with primary, middle with elementary/middle, and high with middle/high schools; and another set of ANOVAs excluded the combined, elementary/middle, and middle/high school teacher responses. Results showed that regardless of whether responses from elementary/middle and middle/high school teachers were included in a collapsed category or excluded from the analysis, the results were similar. Figure A5.3 presents these results.

Executive summary analyses. Analyses of data presented in the executive summary were primarily descriptive in nature (e.g., frequencies, means, and standard deviations), but ANOVA's were conducted when the primary interest was to determine to what degree school level (elementary, middle school, high school) was different on key survey measures. When analysis of variance was conducted, we used the relative difference in standard deviation units as our primary method of communicating meaningfully different results.

The analysis for this report was generated using SAS software using Version 9.2. Copyright, SAS Institute Inc. SAS and all other SAS Institute Inc. product or service names are registered trademarks or trademarks of SAS Institute Inc., Cary, NC, USA.



Note: For each subscale a difference scale is used. For example, *Inform your Instruction* was measured on a seven point scale but *Collaboration with Colleagues* was measured on a six point scale. Data were presented in one figure to illustrate the degree if difference on the outcome measure between the seven school levels. Comparisons should not be made across the subscales.

Figure A5.3. School Level Differences on Key Survey Constructs

Endnotes

1. The number of 41,080 total teachers is based on teacher counts from the 2011 CCD data, summing the number of teachers in this state who work at A1 schools. When the CCD data did not have school-specific teacher counts, then counts were estimated from information found on school websites and were verified with the CCD data using an average of teacher counts from schools with comparable student enrollment.
2. Source: http://applications.education.ky.gov/SRC/DataSets.aspx
3. See Table A1.3 for the numbers used to make this calculation.
4. Source: http://applications.education.ky.gov/SRC/DataSets.aspx under “Profile.”
5. Although the survey consists of 17 subscales, not all were addressed in the executive summary.
6. Luo, M. (2008). Structural equation modeling for high school principals’ data-driven decision making: An analysis of information use environments. *Education Administration Quarterly, 44*, 603–634. Wayman, J. C., Cho, V., Jimerson, J. B., Spikes, D. D. (2012). District-wide effects on data use in the classroom. *Education Policy Analysis Archives, 20*(25). Retrieved from http://epaa.asu.edu/ojs/article/view/979
7. Coburn, C. E. & Talbert, J. E. (2006). Conceptions of evidence use in school districts: Mapping the terrain. *American Journal of Education, 112*, 469–495. Schildkamp, K. & Kuiper, W. (2010). Data-informed curriculum reform: Which data, what purposes, and promoting and hindering factors. *Teaching and Teacher Education, 26*, p. 482–496. Spillane, J. P. 2012. Data in practice: Conceptualizing the data-based decision making phenomenon. *American Journal of Education, 118,* 113–141.
8. The pre-existing surveys used in this study include the following. All items were used with permission. Marsh et al. (2005). The role of districts in fostering instructional improvement. RAND Report. *Use of the District Instructional Improvements Teacher Survey;* Wayman, Cho, and Shaw (2009) Survey of Educator Data Use; U.S. Department of Education, Office of Planning, Evaluation and Policy Development, Policy and Program Studies Service, *National Educational Technology Trends Study: Local-level Data Summary,* Washington, D.C., 2008; U.S. Department of Education, National Center for Education Statistics. *Teacher Preparation and Professional Development: 2000,* NCES 2001–088, by Basmat Parsad, Laurie Lewis, and Elizabeth Farris. Project Officer: Bernard Greene. Washington, DC: 2001.
9. It should be noted that the survey is not intended to measure every facet of the theoretical model. Rather the model was used as a guide for what could reasonably be measured by a survey. Those areas that could be measured using this mode were included, given method applicability and survey length.
10. See footnote 8.
11. http://applications.education.ky.gov/sdci/
12. Fowler, F. J. (1993). *Survey research methods.* Newbury Park, CA: Sage Publications.
13. The comparison here is between the analytic sample and all teachers in the state. This is a proxy for determining if our sample represents, on key demographic information, the larger population. A more appropriate comparison would have been to compare the analytic sample to teachers employed in A1 schools in the state. However, we did not have access to this information and instead made state wide comparisons using all teachers regardless of the type of school they were employed in.

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