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SUBJECT: Technical memo to accompany CE5.2.28 – Meeting 3 materials

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This memo summarizes the researchers' methods to collect and analyze the data presented in the CE5.2.28 Meeting 3 materials. The purpose of Meeting 3 is to increase the capacity of Nebraska Department of Education (NDE) partners to understand and interpret data from the Teacher Data Use Survey (TDUS) they administered in March 2019 (see appendices A and B). REL Central is providing analytical support and will use the data placemat as a way for the partners to visualize their data so that they can identify patterns and trends, make interpretations based on their observations, and discuss key takeaways or implications. Because the data placemat will be printed on legal-sized paper, participants will be able to look across multiple data displays when making observations about patterns in the data. For example, seeing on the same page results about frequency of data use and about perceptions of the usefulness of data may help participants make their observations of findings. During Meeting 3, the partners will discuss next steps, including considering how they may want to communicate findings.

The memo begins with the research questions for the study and a summary of the procedures used to select a sample of educators and administer the TDUS. Next, we describe the overall response rate, the analyses of nonresponse bias, and the calculation of nonresponse weights. The final sections of the memo describe the measures used in the analyses and the details on how analyses were conducted.

Research Questions

The analyses aimed to address five research questions to understand Nebraska teachers' use of summative, interim, and formative data, as well as their perceptions and attitudes about data:

1. How do Nebraska teachers report using summative, interim, and formative data?
2. Are Nebraska principals' perceptions of data use by teachers similar to teachers' reports of their own data use?
3. How do teachers' perceptions about their competence in using data, attitudes toward using data, and perceptions of organizational supports for using data relate to their use of data?
4. How do teachers' use of data, perceptions about their competence in using data, attitudes toward data, and perceptions of organizational supports for using data vary based on teacher characteristics?

- How do teachers' use of data, perceptions about their competence in using data, attitudes toward using data, and perceptions of organizational supports for using data vary based on Nebraska school accountability classifications (that is, *excellent*, *great*, *good*, and *needs improvement*) for the 2018/19 school year?

Sampling and Survey Administration Procedures

During a meeting with NDE partners in December 2018, REL Central discussed considerations for the TDUS sampling plan and sampling techniques, including proportionate and disproportionate cluster sampling. As a result of this meeting, the partners selected a disproportionate sampling approach with clusters for school level (elementary, middle, and high school) and state accountability school classification (*excellent*, *great*, *good*, and *needs improvement*). They selected this approach because of the smaller population sizes for schools classified as *excellent* and *needs improvement*. The partners intended to have a sample of 30 schools from each cluster, but once schools were selected, they learned that seven of the selected schools had closed. Thus, the final sample for the study included 28–30 schools randomly selected from each cluster, for a total of 353 schools (table 1). The participant sample is discussed in the next section.

Table 1. Study sampling matrix with the counts of schools in the state of Nebraska and in the study sample

School accountability classifications	Grade span						Total number of schools	
	Elementary		Middle		High		Nebraska	Sample
	Nebraska	Sample	Nebraska	Sample	Nebraska	Sample		
<i>Needs improvement</i>	74	30	44	29	38	30	156	89
<i>Good</i>	196	30	105	30	88	30	389	90
<i>Great</i>	217	28	113	29	101	30	431	87
<i>Excellent</i>	58	30	39	28	37	29	134	87
Total number of schools	545	118	301	116	264	119	1,110	353

Source. Authors' construction.

During the December 2018 meeting, REL Central also discussed steps for NDE's administration of the TDUS. NDE partners discussed potential strategies for increasing response rates, including when to administer the survey and how to encourage teachers to complete the survey. After this meeting, the partners administered the online survey in March 2019, during a time that did not conflict with other state survey campaigns. NDE emailed the invitation to participate, which included a letter of support from the commissioner of education and encouraged principals to allocate time for teachers to complete the online survey. NDE sent invitations to complete the survey to all teachers in selected schools. NDE sent three follow-up email reminders to survey recipients.

Characteristics of the Analysis Sample and Nonresponse Bias Analyses

For each online survey version (teacher and principal), the study team constructed an analysis sample that included only respondents who had non-missing data on all survey items that were needed to answer all of the study research questions. We considered data to be non-missing if respondents provided a valid answer or if their answer was logically missing. For example, if teachers indicated that they did not have access to a particular assessment, they were not asked about their use of that assessment, resulting in logically missing data.

Total response rates for both versions of the survey fell below the 85% threshold specified in 2019 NCEE guidance. For the teacher version of the survey, the analysis sample included 3,572 respondents, which was a 34.5% response rate. At least one teacher from every sampled school responded to the survey. For the principal version of the survey, the analysis sample included 171 respondents, which was a 48.4% response rate.

The study team conducted a nonresponse bias analysis to determine the extent to which respondents differed from the original sample on key characteristics. The original sample included all respondents who were sent the survey. We calculated means and standard deviations for each characteristic for the original sample and for the analysis sample. Next, we calculated the mean difference between the original sample and analysis sample for each variable. We divided this mean difference by the standard deviation for the original sample. Guidance issued by NCEE in 2019 specifies that analyses should account for any differences greater than .05 standard deviations.

The study team examined a variety of key characteristics that were available in the NDE administrative datasets. These variables were available for every educator who was included in the original sample. For both the teacher and principal surveys, we examined three characteristics of the schools in which they worked: grade span (elementary, middle, or high), accountability designation (*excellent, great, good, or needs improvement*), and Title I status. In addition, for the teacher survey, we examined four personal characteristics: highest degree earned (less than bachelor's degree, bachelor's degree, master's degree, more than master's degree); special education endorsement; full-time equivalent (FTE) status; years of experience in education; and an indicator for whether a teacher taught a core subject). For the principal survey, FTE status was the only personal characteristic that we examined. Prior to the nonresponse calculations, we created dummy variables for all the categorical variables.

The nonresponse bias analyses for teachers indicated that the analysis sample differed from the original sample by more than .05 standard deviations for three characteristics (table 2). A smaller proportion of teachers in the analysis sample worked in high schools (41%) than in the original sample (44%). A greater proportion of teachers in the analysis sample had special education endorsements (24%) than in the original sample (21%). Finally, teachers in the

analysis sample had, on average, more experience working in education (14.93 years) than teachers in the original sample had (14.07 years).

Table 2. Comparison of the original sample of teachers and the analysis sample on key characteristics

Characteristic	Original sample (<i>n</i> = 10,349)		Analysis sample (<i>n</i> = 3,572)		Difference in <i>SD</i> units
	Mean	<i>SD</i>	Mean	<i>SD</i>	
<i>Grade span</i>					
Elementary	0.28	0.45	0.29	0.45	-0.02
Middle	0.29	0.45	0.31	0.46	-0.04
High	0.44	0.50	0.41	0.49	0.06
<i>School accountability classifications</i>					
Needs improvement	0.31	0.46	0.31	0.46	0.00
Good	0.26	0.44	0.26	0.44	-0.01 ^a
Great	0.24	0.42	0.23	0.42	0.02
Excellent	0.19	0.40	0.20	0.40	-0.02
Title I school	0.33	0.47	0.35	0.48	-0.03
<i>Teacher education level</i>					
Less than bachelor's degree	0.00	0.05	0.00	0.06	-0.02 ^a
Bachelor's degree	0.44	0.50	0.42	0.49	0.04
Master's degree	0.55	0.50	0.57	0.50	-0.04
More than master's degree	0.01	0.09	0.01	0.09	0.00
Teacher has a special education endorsement	0.21	0.41	0.24	0.43	-0.07
Teacher FTE status	0.91	0.22	0.91	0.22	0.00
Years in education	14.07	10.25	14.93	10.54	-0.08
Teaches a core subject	0.45	0.50	0.46	0.50	-0.02

Source. Authors' analysis of NDE data.

^a When rounded to two decimal places, the difference between the means for the original sample and analysis sample appears to be zero. However, the means were not, in fact, identical, resulting in a non-zero value for the difference in standard deviation units.

The nonresponse bias analyses for principals indicated that the analysis sample differed from the original sample by more than .05 standard deviations for just one characteristic: Title I school (table 3). A greater proportion of principals in the analysis sample worked in Title I schools (38%) than in the original sample (34%).

Table 3. Comparison of the original sample of principals and the analysis sample on key characteristics

Characteristic	Original sample (<i>n</i> = 353)		Analysis sample (<i>n</i> = 171)		Difference in <i>SD</i> units
	Mean	<i>SD</i>	Mean	<i>SD</i>	
<i>Grade span</i>					
Elementary	0.33	0.47	0.33	0.47	0.01 ^a
Middle	0.33	0.47	0.33	0.47	-0.01 ^a
High	0.34	0.47	0.34	0.47	0.00
<i>School accountability classifications</i>					
Needs improvement	0.25	0.43	0.25	0.43	0.01 ^a
Good	0.25	0.44	0.27	0.45	-0.05
Great	0.25	0.43	0.24	0.43	0.02
Excellent	0.25	0.43	0.24	0.43	0.02
Title I school	0.34	0.48	0.38	0.49	-0.08
Principal FTE status	0.83	0.26	0.82	0.26	0.04

Source. Authors' analysis of NDE data.

^a When rounded to two decimal places, the difference between the means for the original sample and analysis sample appears to be zero. However, the means were not, in fact, identical, resulting in a non-zero value for the difference in standard deviation units.

Nonresponse Weights

To account for the differences between the original sample and the analysis sample, the study team calculated nonresponse weights. We used these weights in the analyses to adjust the analysis sample data so that they more closely resembled the original sample data. The methods we used to calculate the weights are described here, first for teachers and then for principals.

Calculation of Nonresponse Weights for the Teacher Sample

The study team used logistic regression to calculate nonresponse weights for the teacher sample. Using data from all the teachers in the original sample, we fit a logistic regression model that included a binary indicator of whether a teacher was in the analysis sample as the dependent variable. We coded this variable 1 if the teacher was in the analysis sample and 0 if the teacher was not. The model included the three independent variables for which the difference between the original sample and the analysis sample was greater than .05 standard deviations: high school, special education endorsement, and years of experience.

Using the results from the logistic regression, the study team calculated the predicted probability of response for each member of the original sample. Next, we multiplied the inverse of the predicted probability for each case by the overall response rate to calculate the weight. The means and standard deviations for each of the key variables for the original sample

alongside the weighted means and standard deviations for the analysis sample are presented in table 4. This table shows that, once the weights were applied, there were no differences between the original sample and analysis sample on key characteristics that were greater than .05 standard deviations.

Table 4. Comparison of the original sample of teachers and the weighted analysis sample on key characteristics

Characteristic	Original sample (n = 10,349)		Analysis sample (n = 3,572)		Difference in SD units
	Mean	SD	Mean	SD	
<i>Grade span</i>					
Elementary	0.28	0.45	0.27	0.45	0.01
Middle	0.29	0.45	0.29	0.45	-0.01 ^a
High	0.44	0.50	0.43	0.50	0.00
<i>School accountability classifications</i>					
Needs improvement	0.31	0.46	0.31	0.46	-0.01 ^a
Good	0.26	0.44	0.26	0.44	-0.01 ^a
Great	0.24	0.42	0.23	0.42	0.03
Excellent	0.19	0.40	0.20	0.40	-0.01
Title I school	0.33	0.47	0.34	0.47	-0.02
<i>Teacher education level</i>					
Less than bachelor's degree	0.00	0.05	0.00	0.06	-0.04
Bachelor's degree	0.44	0.50	0.43	0.50	0.02
Master's degree	0.55	0.50	0.56	0.50	-0.01
More than master's degree	0.01	0.09	0.01	0.09	0.00
Teacher has a special education endorsement	0.21	0.41	0.22	0.41	0.00
Teacher FTE status	0.91	0.22	0.91	0.22	-0.01 ^a
Years in education	14.07	10.25	14.10	10.26	0.00
Teaches a core subject	0.45	0.50	0.47	0.50	-0.04

Source. Authors' analysis of NDE data.

^a When rounded to two decimal places, the difference between the means for the original sample and analysis sample appears to be zero. However, the means were not, in fact, identical, resulting in a non-zero value for the difference in standard deviation units.

Calculation of Nonresponse Weights for the Principal Sample

The study team also used logistic regression to calculate nonresponse weights for principals. This calculation, however, was not as straightforward. We found that weighting to adjust for one variable led the weighted analysis sample to differ from the original sample by more than .05 standard deviations on additional variables. We followed an iterative process by which we (1) fit additional logistic regressions that included any new variables with differences greater than .05 standard deviations as predictors, (2) calculated new weights, and (3) repeated the nonresponse bias analyses. The details of this iterative process are described here.

Because the original sample and analysis sample differed by greater than .05 standard deviations on just one variable—Title I status—this was the only independent variable in the model. The study team calculated weights using the procedure previously described for the teacher sample. When we compared the descriptive statistics for the key characteristics for the weighted sample to the original sample, the two samples were similar in terms of Title I status (both 34%), but they differed by greater than .05 standard deviations for elementary grade span.

The study team fit a second logistic regression model that included Title I status, elementary grade span, and the interaction between them. We calculated a second set of weights, using the results of this model, and again compared the weighted descriptive statistics for the key characteristics for the analysis sample to the original sample. The result was a weighted analysis sample that was similar to the original sample in terms of Title I (both 34%) and elementary grade span (both 33%), but it differed from the original sample by more than .05 standard deviations on the *good* accountability designation.

The study team fit a third logistic regression model with the following independent variables: Title I status, elementary grade span, and *good* accountability designation, along with all of the interactions between them. We calculated a third set of weights, resulting in a weighted analysis sample that was similar to the original sample in terms of Title I status (both 34%), elementary grade span (both 33%), and *good* accountability designation (both 26%). However, this weighted analysis sample differed from the original sample by greater than .05 standard deviations on principal FTE status.

The study team fit a fourth logistic regression model that included Title I status, elementary grade span, *good* accountability designation, principal FTE status, and all possible two-way, three-way, and four-way interactions. We calculated a fourth and final set of weights. When we applied these weights, the analysis sample did not differ from the original sample on any of the key characteristics by greater than .05 standard deviations (table 5).

Table 5. Comparison of the original sample of principals and the weighted analysis sample on key characteristics

Characteristic	Original sample (<i>n</i> = 353)		Analysis sample (<i>n</i> = 171)		Difference in <i>SD</i> units
	Mean	<i>SD</i>	Mean	<i>SD</i>	
<i>Grade span</i>					
Elementary	0.33	0.47	0.33	0.47	0.00
Middle	0.33	0.47	0.33	0.47	0.01 ^a
High	0.34	0.47	0.34	0.48	-0.01 ^a
<i>School accountability classifications</i>					
Needs improvement	0.25	0.43	0.24	0.43	0.02
Good	0.26	0.44	0.26	0.44	0.00
Great	0.25	0.43	0.25	0.43	-0.01 ^a
Excellent	0.25	0.43	0.25	0.44	-0.02 ^a
Title I school	0.34	0.48	0.34	0.48	0.00 ^a
Principal FTE status	0.83	0.26	0.83	0.26	0.00

Source. Authors' analysis of NDE data.

^a When rounded to two decimal places, the difference between the means for the original sample and analysis sample appears to be zero. However, the means were not, in fact, identical, resulting in a non-zero value for the difference in standard deviation units.

Measures

The study team analyzed TDUS data to address the research questions. Information about each of the variables, including the survey items that compose each scale and the reliability estimates for each scale, is presented in table 6. All of the scales created from survey items had acceptable reliability for both the teacher and principal versions. Complete copies of the teacher and principal versions of the survey are in appendixes A and B, respectively.

Table 6. TDUS variables analyzed to address the research questions

Characteristic	Survey item(s)	Cronbach's alpha coefficient	
		Teacher version	Principal version
Frequency of use of Nebraska Student-Centered Assessment System (NSCAS) English Language Arts	2a	N/A ^a	N/A ^a
Frequency of use of NSCAS Mathematics	2b	N/A ^a	N/A ^a
Frequency of use of NSCAS Science	2c	N/A ^a	N/A ^a
Frequency of use of NSCAS ACT	2d	N/A ^a	N/A ^a
Frequency of use of English Language Proficiency Assessment for the 21st Century (ELPA21)	2e	N/A ^a	N/A ^a

Characteristic	Survey item(s)	Cronbach's alpha coefficient	
		Teacher version	Principal version
Frequency of use of Measures of Academic Progress (MAP) Growth (interim data)	2f	N/A ^a	N/A ^a
Frequency of use of formative assessments	2g	N/A ^a	N/A ^a
Usefulness of summative data	Mean of 3a–e	N/A ^b	N/A ^b
Usefulness of interim data	3f	N/A ^a	N/A ^a
Usefulness of formative data	3g	N/A ^a	N/A ^a
Actions with summative data	Mean of actions with NSCAS English language arts data (4a–4h), actions with NSCAS mathematics data (5a–5h), NSCAS science data (6a–6h), actions with NSCAS ACT data (7a–7h), and actions with ELPA21 data (8a–8h)	.94	.94
Actions with interim data	Mean of 9a–9h	.94	.94
Actions with formative data	Mean of 10a–10h	.92	.92
Competence in using data	Mean of 15a–15d	.92	.91
Attitudes toward data	Mean of 12a–12i	.88	.88
Organizational supports	Mean of 11a–11f, 13a–13f, 14a–14e	.80	.79

Source. Authors' construction.

^a N/A is not applicable. Because this construct is measured with a single item, Cronbach's alpha cannot be calculated.

^b The survey included questions about five types of summative data. Because these summative assessments are administered to students at different grade levels, only a very small percentage of teachers had access to all five types of summative data. Similarly, only a small percentage of principals worked with teachers who had access to all five types of summative data. Thus, it did not make sense to calculate an alpha for this scale.

Analyses to Address Research Questions

The analysis approach for each of the research questions is described in this section.

1. How do Nebraska teachers report using summative, interim, and formative data?

To address the first research question, the study team calculated descriptive statistics (e.g., frequencies, means) for TDUS items related to how often teachers used data to inform their instructional practice. Specifically, these descriptive analyses summarized the frequency with which teachers used summative, interim, and formative assessment data and the actions they take when using each of these assessments to inform practice. Because REL Central believes that NDE staff will want to see the descriptive results, we have included value labels on all visual displays for the placemat.

The visual displays of these results show frequencies for how often teachers used summative, interim, and formative data. The displays also present the means of eight actions teachers reported taking with summative, interim, and formative data. Means are also presented for teacher perceptions of the usefulness of summative, interim, and formative data as well as their perceptions of their competence in using data, attitudes toward data, and organizational supports for data.

REL Central presents scale means, following the TDUS guide, which suggests that using scale means is appropriate when making comparisons across survey scales (i.e., frequency of actions with data, perceived data competence, attitudes toward data, and perceived organizational supports for using data) and across the teacher and principal versions of the survey (Wayman et al., 2016). Furthermore, when a series of individual items that, when combined, measure a particular scale, is analyzed, means are an appropriate method for describing Likert scale data (Boone & Boone, 2012; Sullivan & Artino, 2013). Therefore, we present data displays of means so that participants can visually compare the differences among variables of interest (e.g., data type, respondent type, TDUS scale). Participants would have more difficulty with such comparisons if we presented stacked and clustered bar charts of the frequency distributions for all results presented in the data placemat. When given the option of presenting visualizations of frequency distributions or means, NDE partners preferred means for all items except the different types of assessments, for which they preferred frequency distributions.

2. Are Nebraska principals' perceptions of data use by teachers similar to teachers' reports of their own data use?

The second research question examined the responses across the teacher and principal versions of the TDUS on all analysis variables. It is important to note that principal survey items pertain to principals' perceptions of teacher data use and not their own data use practices. As for research question 1, the study team calculated descriptive statistics (frequencies, means, and standard deviations) for each survey version.

The visual displays of these results present cluster bar charts so that meeting participants can view the teacher and principal ratings side by side. The displays present teacher and principal results related to the frequency of teacher use of summative, interim, and formative data as well as their perceptions of the usefulness of data, teacher competence in using data, teacher attitudes toward data, and teacher perceptions of organizational supports for using data.

3. How do teachers' perceptions about their competence in using data, attitudes toward using data, and perceptions of organizational supports for using data relate to their use of data?

To address this research question, the study team fit three models with each of the following dependent variables: actions with summative data, actions with interim data, and actions with

formative data. At level 1, we included three independent variables: competence in using data, organizational supports, and attitudes toward data. In addition, we included four level-1 covariates: teacher education level (bachelor’s degree or less, master’s degree, more than master’s degree; dummy coded), an indicator of whether a teacher had a special education endorsement, teacher years of experience in education, and an indicator for whether a teacher taught a core subject. We group-mean centered all variables included at level 1. The level-1 equation, with use of summative data as an example, was as follows:

$$USE\ OF\ SUMMATIVE\ DATA_{ij} = \beta_{0j} + \beta_{1j}*(COMPETENCE\ IN\ USING\ DATA_{ij}) + \beta_{2j}*(ORGANIZATIONAL\ SUPPORT_{ij}) + \beta_{3j}*(ATTITUDES\ TOWARD\ DATA\ SCALE_{ij}) + \beta_{4j}*(HAVE\ SPECIAL\ EDUCATION\ ENDORSEMENT_{ij}) + \beta_{5j}*(TEACH\ A\ CORE\ SUBJECT_{ij}) + \beta_{6j}*(MASTERS\ DEGREE_{ij}) + \beta_{7j}*(MORE\ THAN\ A\ MASTERS\ DEGREE_{ij}) + \beta_{8j}*(YEARS\ OF\ EXPERIENCE\ QUARTILE\ 1_{ij}) + \beta_{9j}*(YEARS\ OF\ EXPERIENCE\ QUARTILE\ 2_{ij}) + \beta_{10j}*(YEARS\ OF\ EXPERIENCE\ QUARTILE\ 3_{ij}) + r_{ij}$$

At level 2, the study team included two covariates: grade span (elementary, middle, high; dummy coded) and Title I status. We grand-mean centered these variables. For all three models, the level-2 equations were as follows:

$$\begin{aligned} \beta_{0j} &= \gamma_{00} + \gamma_{01}*(MIDDLE\ SCHOOL_j) + \gamma_{02}*(HIGH\ SCHOOL_j) + \gamma_{03}*(TITLE1_j) + u_{0j} \\ \beta_{1j} &= \gamma_{10} \\ \beta_{2j} &= \gamma_{20} \\ \beta_{3j} &= \gamma_{30} \\ \beta_{4j} &= \gamma_{40} \\ \beta_{5j} &= \gamma_{50} \\ \beta_{6j} &= \gamma_{60} \\ \beta_{7j} &= \gamma_{70} \\ \beta_{8j} &= \gamma_{80} \\ \beta_{9j} &= \gamma_{90} \\ \beta_{10j} &= \gamma_{100} \end{aligned}$$

To present these results, the study team used simple graphical displays to support NDE practitioners in understanding the relationships between the dependent variable (teachers’ actions with data) and the independent variables (their perceptions about their competence in using data, their attitudes toward data, and their perceptions of organizational supports for using data). We presented these results by summative, interim, and formative data types so that practitioners can view and understand the relationships easily. We used arrows to indicate relationships that are statistically significant, shaded the arrows to represent the relative strength of the relationships among the three independent variables (relative strength was based on the beta coefficients for each variable), and included the beta coefficients for each variable. Complete regression results are in appendix C of this memo.

4. How do teachers' use of data, perceptions about their competence in using data, attitudes toward data, and perceptions of organizational supports for using data vary based on teacher characteristics?

To address this research question, the study team fit six models with each of the following dependent variables: actions with summative data, actions with interim data, actions with formative data, competence in using data, attitudes toward data, and organizational supports. In these models, teacher characteristics served as the independent variables of interest. Specifically, at level 1, we added the following variables: teacher education (bachelor's degree or less, master's degree, more than master's degree; dummy coded), years in education, an indicator for whether a teacher had a special education endorsement, and an indicator for whether a teacher taught a core subject. We group-mean centered all variables included at level 1. The level-1 equation, with use of summative data as an example, was as follows:

$$USE\ OF\ SUMMATIVE\ DATA_{ij} = \beta_{0j} + \beta_{1j}*(MASTERS\ DEGREE_{ij}) + \beta_{2j}*(MORE\ THAN\ A\ MASTERS\ DEGREE_{ij}) + \beta_{3j}*(HAVE\ SPECIAL\ EDUCATION\ ENDORSEMENT_{ij}) + \beta_{4j}*(TEACH\ A\ CORE\ SUBJECT_{ij}) + \beta_{5j}*(YEARS\ OF\ EXPERIENCE\ QUARTILE\ 1_{ij}) + \beta_{6j}*(YEARS\ OF\ EXPERIENCE\ QUARTILE\ 2_{ij}) + \beta_{7j}*(YEARS\ OF\ EXPERIENCE\ QUARTILE\ 3_{ij}) + r_{ij}$$

At level 2, the study team included two covariates: grade span (elementary, middle, high; dummy coded) and Title I status. We grand-mean centered these variables. For all six models, the level-2 equations were as follows:

$$\beta_{0j} = \gamma_{00} + \gamma_{01}*(MIDDLE\ SCHOOL_j) + \gamma_{02}*(HIGH\ SCHOOL_j) + \gamma_{03}*(TITLE1_j) + u_{0j}$$

$$\beta_{1j} = \gamma_{10}$$

$$\beta_{2j} = \gamma_{20}$$

$$\beta_{3j} = \gamma_{30}$$

$$\beta_{4j} = \gamma_{40}$$

$$\beta_{5j} = \gamma_{50}$$

$$\beta_{6j} = \gamma_{60}$$

$$\beta_{7j} = \gamma_{70}$$

Because interpreting coefficients, and even effect sizes, from the models could be difficult for the NDE practitioner audience, the study team presented visual displays of the adjusted means for the dependent variables by teacher characteristic. Annotations show a statistically significant difference between the reference group (e.g., bachelor's degree or less) and the other independent variables (e.g., master's degree, advanced degree). Complete regression results are in appendix C of this memo.

5. How do teachers' use of data, perceptions about their competence in using data, attitudes toward data, and perceptions of organizational supports for using data vary based on Nebraska school accountability classifications (that is, *excellent*, *great*, *good*, and *needs improvement*) for the 2018/19 school year?

To address this question, the study team fit six multilevel models, each with one of the following dependent variables: actions with summative data, actions with interim data, actions with formative data, competence in using data, attitudes toward data, and organizational supports for using data. At level 1, these models were identical to the models fit to address research question 4. At level 2, we added school accountability classifications as independent variables (*needs improvement*, *good*, *great*, *excellent*; dummy coded). As for the other level-2 variables, we grand-mean centered these dummy variables. The level-2 equations were as follows:

$$\beta_{0j} = \gamma_{00} + \gamma_{01}*(MIDDLE\ SCHOOL_j) + \gamma_{02}*(HIGH\ SCHOOL_j) + \gamma_{03}*(TITLE1_j) + \gamma_{04}*(GOOD_j) + \gamma_{05}*(GREAT_j) + \gamma_{06}*(EXCELLENT_j) + u_{0j}$$

$$\beta_{1j} = \gamma_{10}$$

$$\beta_{2j} = \gamma_{20}$$

$$\beta_{3j} = \gamma_{30}$$

$$\beta_{4j} = \gamma_{40}$$

$$\beta_{5j} = \gamma_{50}$$

$$\beta_{6j} = \gamma_{60}$$

$$\beta_{7j} = \gamma_{70}$$

As for research question 4, the study team presented results using the adjusted means generated from the models. Annotations show a statistically significant difference between the reference group (*needs improvement* schools) and the other independent variables (*good*, *great*, and *excellent*). Complete regression results are in appendix C of this memo.

References

- Boone, Jr., H. N., & Boone, D. A. (2012). Analyzing Likert data. *Journal of Extension*, 50(2). <https://joe.org/joe/2012april/tt2.php>
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Appendix A: Teacher survey



Teacher Data Use Survey [Teacher Version]

Welcome! The purpose of the Teacher Data Use Survey is to learn about how teachers use data for educational improvement in your district. Administering the Teacher Data Use Survey can provide many benefits to district and school leaders as well as teachers. Some of the benefits include:

A comprehensive perspective on how teachers use data, their attitudes toward data, and the supports that help them use data.

An evidence base from which to plan ongoing support, such as professional development, computer data systems, and collaborative structures for data use.

A triangulated assessment of how administrator and instructional support staff view teacher data use.

The Teacher Data Use Survey takes about 15-20 minutes to complete. Your responses will remain confidential, and reports will only use aggregated results.

As a teacher, we value your input and trust that the information you provide will be vital to the success of this survey. Please continue to the next page to start the survey.

The Teacher Data Use Survey is prepared by Jeffrey C. Wayman, Vincent Cho, Ellen B. Mandinach, Jonathan A. Supovitz, and Stephanie B. Wilkerson for the Institute of Education Sciences (IES) under Contract ED-JES-12-C-0005 by Regional Educational Laboratory Appalachia administered by CNA.

-
1. Are the following forms of data available to you at **[School]**?
- | | Yes | No |
|---|-----|-----|
| a. NSCAS-English Language Arts | () | () |
| b. NSCAS-Mathematics | () | () |
| c. NSCAS-Science | () | () |
| d. NSCAS-ACT | () | () |
| e. ELPA21 | () | () |
| f. MAP Growth (NWEA) | () | () |
| g. Formative Assessments | () | () |
| h. Perceptual Data (<i>i.e., perceptions of learning environment</i>) | () | () |
| i. Other (please specify): | () | () |

If you indicated “no” to all options in question 1, skip to question 11. If you responded “yes” to any option, please proceed to question 2.

2. Teachers use all kinds of information (i.e., data) to help plan for instruction that meets student learning needs. How frequently do you use the following forms of data?

	Do not use	Less than once a month	Once or twice a month	Weekly or almost weekly	A few times a week
a. NSCAS-English Language Arts	()	()	()	()	()
b. NSCAS-Mathematics	()	()	()	()	()
c. NSCAS-Science	()	()	()	()	()
d. NSCAS-ACT	()	()	()	()	()
e. ELPA21	()	()	()	()	()
f. MAP Growth (NWEA)	()	()	()	()	()
g. Formative Assessments	()	()	()	()	()
h. Perceptual Data (<i>i.e., perceptions of learning environment</i>)	()	()	()	()	()
i. Other:	()	()	()	()	()

3. Now, how useful are the following forms of data to your practice?

	Not useful	Somewhat useful	Useful	Very useful
a. NSCAS-English Language Arts	()	()	()	()
b. NSCAS-Mathematics	()	()	()	()
c. NSCAS-Science	()	()	()	()
d. NSCAS-ACT	()	()	()	()
e. ELPA21	()	()	()	()
f. MAP Growth (NWEA)	()	()	()	()
g. Formative Assessments	()	()	()	()
h. Perceptual Data (<i>i.e., perceptions of learning environment</i>)	()	()	()	()
i. Other:	()	()	()	()

If you indicated that NSCAS-English Language Arts is “not available” to you in question 1, OR if you indicated that you “do not use” NSCAS-English Language Arts in question 2, please go to question 5.

4. These questions ask about [NSCAS-English Language Arts](#). In a typical school year, how often do you do the following?

	One or two times a year	A few times a year	Monthly	Weekly
a. Use NSCAS-English Language Arts to identify instructional content to use in class.	()	()	()	()
b. Use NSCAS-English Language Arts to tailor instruction to individual students' needs.	()	()	()	()
c. Use NSCAS-English Language Arts to develop recommendations for additional instructional support.	()	()	()	()
d. Use NSCAS-English Language Arts to form small groups of students for targeted instruction.	()	()	()	()

	One or two times a year	A few times a year	Monthly	Weekly
e. Discuss NSCAS-English Language Arts with a parent or guardian.	()	()	()	()
f. Discuss NSCAS-English Language Arts with a student.	()	()	()	()
g. Meet with a specialist (e.g., instructional coach or data coach) about NSCAS-English Language Arts.	()	()	()	()
h. Meet with another teacher about NSCAS- English Language Arts.	()	()	()	()

If you indicated that NSCAS-Mathematics is “not available” to you in question 1, OR if you indicated that you “do not use” NSCAS-Mathematics in question 2, please go to question 6.

5. These questions ask about NSCAS-Mathematics. In a typical school year, how often do you do the following?

	One or two times a year	A few times a year	Monthly	Weekly
a. Use NSCAS-Mathematics to identify instructional content to use in class.	()	()	()	()
b. Use NSCAS-Mathematics to tailor instruction to individual students' needs.	()	()	()	()
c. Use NSCAS-Mathematics to develop recommendations for additional instructional support.	()	()	()	()
d. Use NSCAS-Mathematics to form small groups of students for targeted instruction.	()	()	()	()
e. Discuss NSCAS-Mathematics with a parent or guardian.	()	()	()	()
f. Discuss NSCAS-Mathematics with a student.	()	()	()	()
g. Meet with a specialist (e.g., instructional coach or data coach) about NSCAS-Mathematics.	()	()	()	()
h. Meet with another teacher about NSCAS-Mathematics.	()	()	()	()

If you indicated that NSCAS-Science is “not available” to you in question 1, OR if you indicated that you “do not use” NSCAS-Science in question 2, please go to question 7.

6. These questions ask about NSCAS-Science. In a typical school year, how often do you do the following?

	One or two times a year	A few times a year	Monthly	Weekly
a. Use NSCAS-Science to identify instructional content to use in class.	()	()	()	()
b. Use NSCAS-Science to tailor instruction to individual students' needs.	()	()	()	()
c. Use NSCAS-Science to develop recommendations for additional instructional support.	()	()	()	()
d. Use NSCAS-Science to form small groups of students for targeted instruction.	()	()	()	()
e. Discuss NSCAS-Science with a parent or guardian.	()	()	()	()
f. Discuss NSCAS-Science with a student.	()	()	()	()
g. Meet with a specialist (e.g., instructional coach or data coach) about NSCAS-Science.	()	()	()	()
h. Meet with another teacher about NSCAS-Science.	()	()	()	()

If you indicated that NSCAS-ACT is “not available” to you in question 1, OR if you indicated that you “do not use” NSCAS-ACT in question 2, please go to question 8.

7. These questions ask about NSCAS-ACT. In a typical school year, how often do you do the following?

	One or two times a year	A few times a year	Monthly	Weekly
a. Use NSCAS-ACT to identify instructional content to use in class.	()	()	()	()
b. Use NSCAS-ACT to tailor instruction to individual students' needs.	()	()	()	()
c. Use NSCAS-ACT to develop recommendations for additional instructional support.	()	()	()	()
d. Use NSCAS-ACT to form small groups of students for targeted instruction.	()	()	()	()
e. Discuss NSCAS-ACT with a parent or guardian.	()	()	()	()
f. Discuss NSCAS-ACT with a student.	()	()	()	()

	One or two times a year	A few times a year	Monthly	Weekly
g. Meet with a specialist (e.g., instructional coach or data coach) about NSCAS-ACT.	()	()	()	()
h. Meet with another teacher about NSCAS-ACT.	()	()	()	()

If you indicated that ELPA21 is “not available” to you in question 1, OR if you indicated that you “do not use” ELPA21 in question 2, please go to question 9.

8. These questions ask about ELPA21. In a typical school year, how often do you do the following?

	One or two times a year	A few times a year	Monthly	Weekly
a. Use ELPA21 to identify instructional content to use in class.	()	()	()	()
b. Use ELPA21 to tailor instruction to individual students' needs.	()	()	()	()
c. Use ELPA21 to develop recommendations for additional instructional support.	()	()	()	()
d. Use ELPA21 to form small groups of students for targeted instruction.	()	()	()	()
e. Discuss ELPA21 with a parent or guardian.	()	()	()	()
f. Discuss ELPA21 with a student.	()	()	()	()
g. Meet with a specialist (e.g., instructional coach or data coach) about ELPA21.	()	()	()	()
h. Meet with another teacher about ELPA21.	()	()	()	()

If you indicated that MAP Growth (NWEA) is “not available” to you in question 1, OR if you indicated that you “do not use” MAP Growth (NWEA) in question 2, please go to question 10.

9. These questions ask about MAP Growth (NWEA) used in your school or district. In a typical month, how often do you do the following?

	Less than once a month	Once or twice a month	Weekly or almost weekly	A few times a week
a. Use MAP Growth (NWEA) to identify instructional content to use in class.	()	()	()	()
b. Use MAP Growth (NWEA) to tailor instruction to individual students' needs.	()	()	()	()

	Less than once a month	Once or twice a month	Weekly or almost weekly	A few times a week
c. Use MAP Growth (NWEA) to develop recommendations for additional instructional support.	()	()	()	()
d. Use MAP Growth (NWEA) to form small groups of students for targeted instruction.	()	()	()	()
e. Discuss MAP Growth (NWEA) with a parent or guardian.	()	()	()	()
f. Discuss MAP Growth (NWEA) with a student.	()	()	()	()
g. Meet with a specialist (e.g., instructional coach or data coach) about MAP Growth (NWEA).	()	()	()	()
h. Meet with another teacher about MAP Growth (NWEA).	()	()	()	()

If you indicated that Formative Assessments are “not available” to you in question 1, OR if you indicated that you “do not use” Formative Assessments in question 2, please go to question 11.

10. These questions ask about Formative Assessments developed and used in your school or district. In a typical month, how often do you do the following?

	Less than once a month	Once or twice a month	Weekly or almost weekly	A few times a week
a. Use Formative Assessments to identify instructional content to use in class.	()	()	()	()
b. Use Formative Assessments to tailor instruction to individual students' needs.	()	()	()	()
c. Use Formative Assessments to develop recommendations for additional instructional support.	()	()	()	()
d. Use Formative Assessments to form small groups of students for targeted instruction.	()	()	()	()
e. Discuss Formative Assessments with a parent or guardian.	()	()	()	()
f. Discuss Formative Assessments with a student.	()	()	()	()

	Less than once a month	Once or twice a month	Weekly or almost weekly	A few times a week
g. Meet with a specialist (e.g., instructional coach or data coach) about Formative Assessments.	()	()	()	()
h. Meet with another teacher about Formative Assessments .	()	()	()	()

The remainder of this survey asks general questions about the use of data to inform your education practice. For the rest of this survey, please consider only the following when you are asked about "data":

[NSCAS-English Language Arts](#)
[NSCAS-Mathematics](#)
[NSCAS-Science](#)
[NSCAS-ACT](#)
[ELPA21](#)
 MAP Growth (NWEA)
 Formative assessments

11. These questions ask about supports for using data. Please indicate how much you agree or disagree with the following statements:

	Strongly disagree	Disagree	Agree	Strongly agree
a. I am adequately supported in the effective use of data.	()	()	()	()
b. I am adequately prepared to use the data.	()	()	()	()
c. There is someone who answers my questions about using data.	()	()	()	()
d. There is someone who helps me change my practice (e.g., my teaching) based on data.	()	()	()	()
e. My district provides enough professional development about data use.	()	()	()	()
f. My district's professional development is useful for learning about data use.	()	()	()	()

12. These questions ask about your attitudes and opinions regarding data. Please indicate how much you agree or disagree with the following statements:

	Strongly disagree	Disagree	Agree	Strongly agree
a. Data help teachers plan instruction.	()	()	()	()

	Strongly disagree	Disagree	Agree	Strongly agree
b. Data offer information about students that was not already known.	()	()	()	()
c. Data help teachers know what concepts students are learning.	()	()	()	()
d. Data help teachers identify learning goals for students.	()	()	()	()
e. Students benefit when teacher instruction is informed by data.	()	()	()	()
f. I think it is important to use data to inform education practice.	()	()	()	()
g. I like to use data.	()	()	()	()
h. I find data useful.	()	()	()	()
i. Using data helps me be a better teacher.	()	()	()	()

13. These questions ask how your principal and assistant principal(s) support you in using data. Principals and assistant principals will not be able to see your answers. Please indicate how much you agree or disagree with the following statements:

	Strongly disagree	Disagree	Agree	Strongly agree
a. My principal or assistant principal(s) encourages data use as a tool to support effective teaching.	()	()	()	()
b. My principal or assistant principal(s) creates many opportunities for teachers to use data.	()	()	()	()
c. My principal or assistant principal(s) has made sure teachers have plenty of training for data use.	()	()	()	()
d. My principal or assistant principal(s) is a good example of an effective data user.	()	()	()	()
e. My principal or assistant principal(s) discusses data with me.	()	()	()	()
f. My principal or assistant principal(s) creates protected time for using data.	()	()	()	()

14. Your school or district gives you programs, systems, and other technology to help you access and use student data. The following questions ask about these computer systems. Please indicate how much you agree or disagree with the following statements:

	Strongly disagree	Disagree	Agree	Strongly agree
a. I have the proper technology to efficiently examine data.	()	()	()	()
b. The computer systems in my district provide me access to lots of data.	()	()	()	()
c. The computer systems (for data use) in my district are easy to use.	()	()	()	()
d. The computer systems in my district allow me to examine various types of data at once (e.g., attendance, achievement, demographics).	()	()	()	()
e. The computer systems in my district generate displays (e.g., reports, graphs, tables) that are useful to me.	()	()	()	()

15. These questions ask about your attitudes towards your own use of data. Please indicate how much you agree or disagree with the following statements.

	Strongly disagree	Disagree	Agree	Strongly agree
a. I am good at using data to diagnose student learning needs.	()	()	()	()
b. I am good at adjusting instruction based on data.	()	()	()	()
c. I am good at using data to plan lessons.	()	()	()	()
d. I am good at using data to set student learning goals.	()	()	()	()

16. Please select the grade(s) to which you are assigned at THIS school: **[School]**

Please check all that apply. If you do not teach specific grades, please select the last option "None of the above".

- Prekindergarten
- Kindergarten
- 1st Grade
- 2nd Grade
- 3rd Grade
- 4th Grade
- 5thGrade
- 6thGrade
- 7th Grade
- 8th Grade
- 9th Grade
- 10th Grade

- 11th Grade
- 12th Grade
- None of the above

17. Please specify the number of years you have been TEACHING.

18. What else would you like to share with us about data use?

#NOE 02-4228

For more information about this survey, please contact: NDE.Research@nebraska.gov | Nebraska Department of Education

Appendix B: Principal survey



Teacher Data Use Survey [Principal Version]

Welcome! The purpose of the Teacher Data Use Survey is to learn about how teachers use data for educational improvement in your district. Administering the Teacher Data Use Survey can provide many benefits to district and school leaders as well as teachers. Some of the benefits include:

A comprehensive perspective on how teachers use data, their attitudes toward data, and the supports that help them use data.

An evidence base from which to plan ongoing support, such as professional development, computer data systems, and collaborative structures for data use.

A triangulated assessment of how administrator and instructional support staff view teacher data use.

The Teacher Data Use Survey takes about 15-20 minutes to complete. Your responses will remain confidential, and reports will only use aggregated results .

As a principal, we value your input and trust that the information you provide will be vital to the success of this survey. Please continue to the next page to start the survey.

The Teacher Data Use Survey is prepared by Jeffrey C. Wayman, Vincent Cho, Ellen B. Mandinach, Jonathan A. Supovitz, and Stephanie B. Wilkerson for the Institute of Education Sciences (IES) under Contract ED-JES-12-C-0005 by Regional Educational Laboratory Appalachia administered by CNA.

-
1. Are the following forms of data available to your teachers at [school]?
- | | Yes | No |
|---|-----|-----|
| a. NSCAS-English Language Arts | () | () |
| b. NSCAS-Mathematics | () | () |
| c. NSCAS-Science | () | () |
| d. NSCAS-ACT | () | () |
| e. ELPA21 | () | () |
| f. MAP Growth (NWEA) | () | () |
| g. Formative Assessments | () | () |
| h. Perceptual Data (<i>i.e., perceptions of learning environment</i>) | () | () |
| i. Other (please specify): | () | () |

If you indicated “no” to all options in question 1, skip to question 11. If you responded “yes” to any option, please proceed to question 2.

2. Teachers use all kinds of information (i.e., data) to help plan for instruction that meets student learning needs. How frequently do your teachers use the following forms of data?

	Do not use	Less than once a month	Once or twice a month	Weekly or almost weekly	A few times a week
a. NSCAS-English Language Arts	()	()	()	()	()
b. NSCAS-Mathematics	()	()	()	()	()
c. NSCAS-Science	()	()	()	()	()
d. NSCAS-ACT	()	()	()	()	()
e. ELPA21	()	()	()	()	()
f. MAP Growth (NWEA)	()	()	()	()	()
g. Formative Assessments	()	()	()	()	()
h. Perceptual Data (<i>i.e., perceptions of learning environment</i>)	()	()	()	()	()
i. Other:	()	()	()	()	()

3. Now, how useful are the following forms of data to teachers' practice?

	Not useful	Somewhat useful	Useful	Very useful
a. NSCAS-English Language Arts	()	()	()	()
b. NSCAS-Mathematics	()	()	()	()
c. NSCAS-Science	()	()	()	()
d. NSCAS-ACT	()	()	()	()
e. ELPA21	()	()	()	()
f. MAP Growth (NWEA)	()	()	()	()
g. Formative Assessments	()	()	()	()
h. Perceptual Data (<i>i.e., perceptions of learning environment</i>)	()	()	()	()
i. Other:	()	()	()	()

If you indicated that NSCAS-English Language Arts is “not available” to you in question 1, OR if you indicated that you “do not use” NSCAS-English Language Arts in question 2, please go to question 5.

4. These questions ask about [NSCAS-English Language Arts](#). In a typical school year, how often do your teachers do the following?

	One or two times a year	A few times a year	Monthly	Weekly
a. Use NSCAS-English Language Arts to identify instructional content to use in class.	()	()	()	()
b. Use NSCAS-English Language Arts to tailor instruction to individual students' needs.	()	()	()	()
c. Use NSCAS-English Language Arts to develop recommendations for additional instructional support.	()	()	()	()
d. Use NSCAS-English Language Arts to form small groups of students for targeted instruction.	()	()	()	()

	One or two times a year	A few times a year	Monthly	Weekly
e. Discuss NSCAS-English Language Arts with a parent or guardian.	()	()	()	()
f. Discuss NSCAS-English Language Arts with a student.	()	()	()	()
g. Meet with a specialist (e.g., instructional coach or data coach) about NSCAS-English Language Arts.	()	()	()	()
h. Meet with another teacher about NSCAS- English Language Arts.	()	()	()	()

If you indicated that NSCAS-Mathematics is “not available” to you in question 1, OR if you indicated that you “do not use” NSCAS-Mathematics in question 2, please go to question 6.

5. These questions ask about NSCAS-Mathematics. In a typical school year, how often do your teachers do the following?

	One or two times a year	A few times a year	Monthly	Weekly
a. Use NSCAS-Mathematics to identify instructional content to use in class.	()	()	()	()
b. Use NSCAS-Mathematics to tailor instruction to individual students' needs.	()	()	()	()
c. Use NSCAS-Mathematics to develop recommendations for additional instructional support.	()	()	()	()
d. Use NSCAS-Mathematics to form small groups of students for targeted instruction.	()	()	()	()
e. Discuss NSCAS-Mathematics with a parent or guardian.	()	()	()	()
f. Discuss NSCAS-Mathematics with a student.	()	()	()	()
g. Meet with a specialist (e.g., instructional coach or data coach) about NSCAS-Mathematics.	()	()	()	()
h. Meet with another teacher about NSCAS-Mathematics.	()	()	()	()

If you indicated that NSCAS-Science is “not available” to you in question 1, OR if you indicated that you “do not use” NSCAS-Science in question 2, please go to question 7.

6. These questions ask about NSCAS-Science. In a typical school year, how often do your teachers do the following?

	One or two times a year	A few times a year	Monthly	Weekly
a. Use NSCAS-Science to identify instructional content to use in class.	()	()	()	()
b. Use NSCAS-Science to tailor instruction to individual students' needs.	()	()	()	()
c. Use NSCAS-Science to develop recommendations for additional instructional support.	()	()	()	()
d. Use NSCAS-Science to form small groups of students for targeted instruction.	()	()	()	()
e. Discuss NSCAS-Science with a parent or guardian.	()	()	()	()
f. Discuss NSCAS-Science with a student.	()	()	()	()
g. Meet with a specialist (e.g., instructional coach or data coach) about NSCAS-Science.	()	()	()	()
h. Meet with another teacher about NSCAS-Science.	()	()	()	()

If you indicated that NSCAS-ACT is “not available” to you in question 1, OR if you indicated that you “do not use” NSCAS-ACT in question 2, please go to question 8.

7. These questions ask about NSCAS-ACT. In a typical school year, how often do your teachers do the following?

	One or two times a year	A few times a year	Monthly	Weekly
a. Use NSCAS-ACT to identify instructional content to use in class.	()	()	()	()
b. Use NSCAS-ACT to tailor instruction to individual students' needs.	()	()	()	()
c. Use NSCAS-ACT to develop recommendations for additional instructional support.	()	()	()	()
d. Use NSCAS-ACT to form small groups of students for targeted instruction.	()	()	()	()
e. Discuss NSCAS-ACT with a parent or guardian.	()	()	()	()

	One or two times a year	A few times a year	Monthly	Weekly
f. Discuss NSCAS-ACT with a student.	()	()	()	()
g. Meet with a specialist (e.g., instructional coach or data coach) about NSCAS-ACT.	()	()	()	()
h. Meet with another teacher about NSCAS-ACT.	()	()	()	()

If you indicated that ELPA21 is “not available” to you in question 1, OR if you indicated that you “do not use” ELPA21 in question 2, please go to question 9.

8. These questions ask about ELPA21. In a typical school year, how often do your teachers do the following?

	One or two times a year	A few times a year	Monthly	Weekly
a. Use ELPA21 to identify instructional content to use in class.	()	()	()	()
b. Use ELPA21 to tailor instruction to individual students' needs.	()	()	()	()
c. Use ELPA21 to develop recommendations for additional instructional support.	()	()	()	()
d. Use ELPA21 to form small groups of students for targeted instruction.	()	()	()	()
e. Discuss ELPA21 with a parent or guardian.	()	()	()	()
f. Discuss ELPA21 with a student.	()	()	()	()
g. Meet with a specialist (e.g., instructional coach or data coach) about ELPA21.	()	()	()	()
h. Meet with another teacher about ELPA21.	()	()	()	()

If you indicated that MAP Growth (NWEA) is “not available” to you in question 1, OR if you indicated that you “do not use” MAP Growth (NWEA) in question 2, please go to question 10.

9. These questions ask about MAP Growth (NWEA) used in your school or district. In a typical month, how often do your teachers do the following?

	Less than once a month	Once or twice a month	Weekly or almost weekly	A few times a week
a. Use MAP Growth (NWEA) to identify instructional content to use in class.	()	()	()	()

	Less than once a month	Once or twice a month	Weekly or almost weekly	A few times a week
b. Use MAP Growth (NWEA) to tailor instruction to individual students' needs.	()	()	()	()
c. Use MAP Growth (NWEA) to develop recommendations for additional instructional support.	()	()	()	()
d. Use MAP Growth (NWEA) to form small groups of students for targeted instruction.	()	()	()	()
e. Discuss MAP Growth (NWEA) with a parent or guardian.	()	()	()	()
f. Discuss MAP Growth (NWEA) with a student.	()	()	()	()
g. Meet with a specialist (e.g., instructional coach or data coach) about MAP Growth (NWEA).	()	()	()	()
h. Meet with another teacher about MAP Growth (NWEA).	()	()	()	()

If you indicated that Formative Assessments are “not available” to you in question 1, OR if you indicated that you “do not use” Formative Assessments in question 2, please go to question 11.

10. These questions ask about Formative Assessments developed and used in your school or district. In a typical month, how often do your teachers do the following?

	Less than once a month	Once or twice a month	Weekly or almost weekly	A few times a week
a. Use Formative Assessments to identify instructional content to use in class.	()	()	()	()
b. Use Formative Assessments to tailor instruction to individual students' needs.	()	()	()	()
c. Use Formative Assessments to develop recommendations for additional instructional support.	()	()	()	()
d. Use Formative Assessments to form small groups of students for targeted instruction.	()	()	()	()
e. Discuss Formative Assessments with a parent or guardian.	()	()	()	()
f. Discuss Formative Assessments with a student.	()	()	()	()
g. Meet with a specialist (e.g., instructional coach or data coach) about Formative Assessments.	()	()	()	()

	Less than once a month	Once or twice a month	Weekly or almost weekly	A few times a week
h. Meet with another teacher about Formative Assessments.	()	()	()	()

The remainder of this survey asks general questions about the use of data to inform your education practice. For the rest of this survey, please consider only the following when you are asked about “data”:

- [NSCAS-English Language Arts](#)
- [NSCAS-Mathematics](#)
- [NSCAS-Science](#)
- [NSCAS-ACT](#)
- [ELPA21](#)
- MAP Growth (NWEA)
- Formative Assessments

11. These questions ask about supports for using data. Please indicate how much you agree or disagree with the following statements:

	Strongly disagree	Disagree	Agree	Strongly agree
a. My teachers are adequately supported in the effective use of data.	()	()	()	()
b. My teachers are adequately prepared to use the data.	()	()	()	()
c. There is someone who answers my teachers' questions about using data.	()	()	()	()
d. There is someone who helps my teachers change their practice (e.g., their teaching) based on data.	()	()	()	()
e. My district provides my teachers enough professional development about data use.	()	()	()	()
f. My district's professional development for my teachers is useful for learning about data use.	()	()	()	()

12. These questions ask about your attitudes and opinions regarding data. Please indicate how much you agree or disagree with the following statements:

	Strongly disagree	Disagree	Agree	Strongly agree
a. Data help teachers plan instruction.	()	()	()	()
b. Data offer information about students that was not already known.	()	()	()	()

	Strongly disagree	Disagree	Agree	Strongly agree
c. Data help teachers know what concepts students are learning.	()	()	()	()
d. Data help teachers identify learning goals for students.	()	()	()	()
e. Students benefit when teacher instruction is informed by data.	()	()	()	()
f. I think it is important to use data to inform education practice.	()	()	()	()
g. I like to use data.	()	()	()	()
h. I find data useful.	()	()	()	()
i. Using data helps me be a better educator.	()	()	()	()

13. These questions ask about teacher supports for using data. Please indicate how much you agree or disagree with the following statements:

	Strongly disagree	Disagree	Agree	Strongly agree
a. I encourage data use as a tool to support effective teaching.	()	()	()	()
b. I create many opportunities for teachers to use data.	()	()	()	()
c. I have made sure teachers have plenty of training for data use.	()	()	()	()
d. I am a good example of an effective data user.	()	()	()	()
e. I discuss data with my teachers.	()	()	()	()
f. I create protected time for using data.	()	()	()	()

14. Your school or district gives you programs, systems, and other technology to help you access and use student data. The following questions ask about these computer systems. Please indicate how much you agree or disagree with the following statements:

	Strongly disagree	Disagree	Agree	Strongly agree
a. I have the proper technology to efficiently examine data.	()	()	()	()
b. The computer systems in my district provide me access to lots of data.	()	()	()	()

	Strongly disagree	Disagree	Agree	Strongly agree
c. The computer systems (for data use) in my district are easy to use.	()	()	()	()
d. The computer systems in my district allow me to examine various types of data at once (e.g., attendance, achievement, demographics).	()	()	()	()
e. The computer systems in my district generate displays (e.g., reports, graphs, tables) that are useful to me.	()	()	()	()

15. These questions ask about your attitudes towards your teachers' use of data. Please indicate how much you agree or disagree with the following statements:

	Strongly disagree	Disagree	Agree	Strongly agree
a. My teachers are good at using data to diagnose student learning needs.	()	()	()	()
b. My teachers are good at adjusting instruction based on data.	()	()	()	()
c. My teachers are good at using data to plan lessons.	()	()	()	()
d. My teachers are good at using data to set student learning goals.	()	()	()	()

16. What else would you like to share with us about data use?

#NOE 02-4228

For more information about this survey, please contact: NDE.Research@nebraska.gov | Nebraska Department of Education

Appendix C: Supporting analyses

This appendix provides information about sample sizes for survey questions that only some respondents answered due to skip patterns. The information appears in flow charts that demonstrate why the sample size for each item decreased from the full analysis sample to the smaller samples in the figures on the data placemat. First, information for teacher respondents is presented in figures C1–C13, followed by information for principal respondents in figures C14–C23. Next, complete results for the hierarchical linear models are in tables C1–C15.

Figure C1. Reasons for reduction in the teacher sample size for frequency of use of NSCAS-English Language Arts data (survey question 2a)

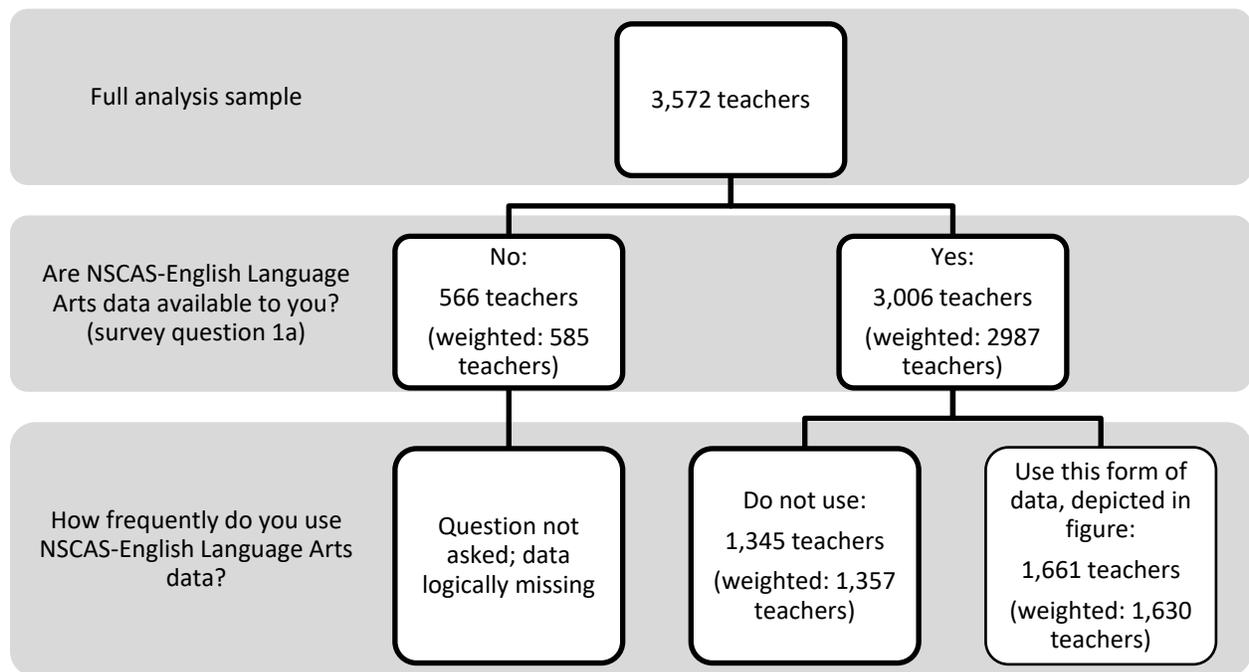


Figure C2. Reasons for reduction in the teacher sample size for frequency of use of NSCAS-Mathematics data (survey question 2b)

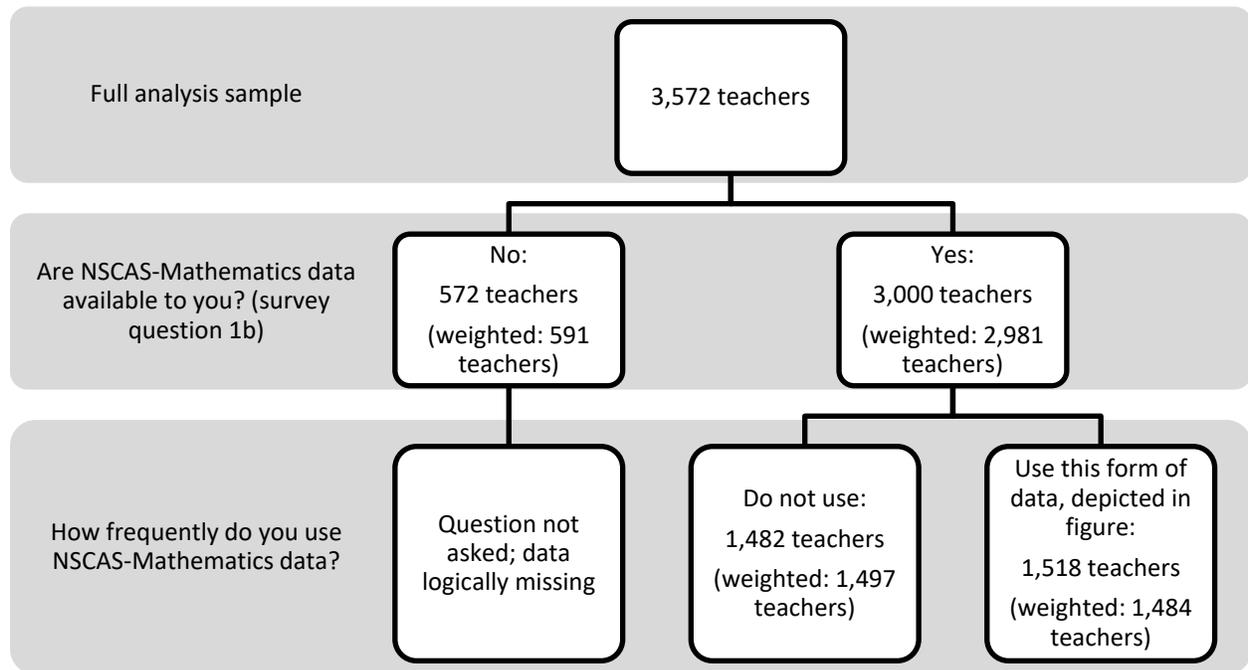
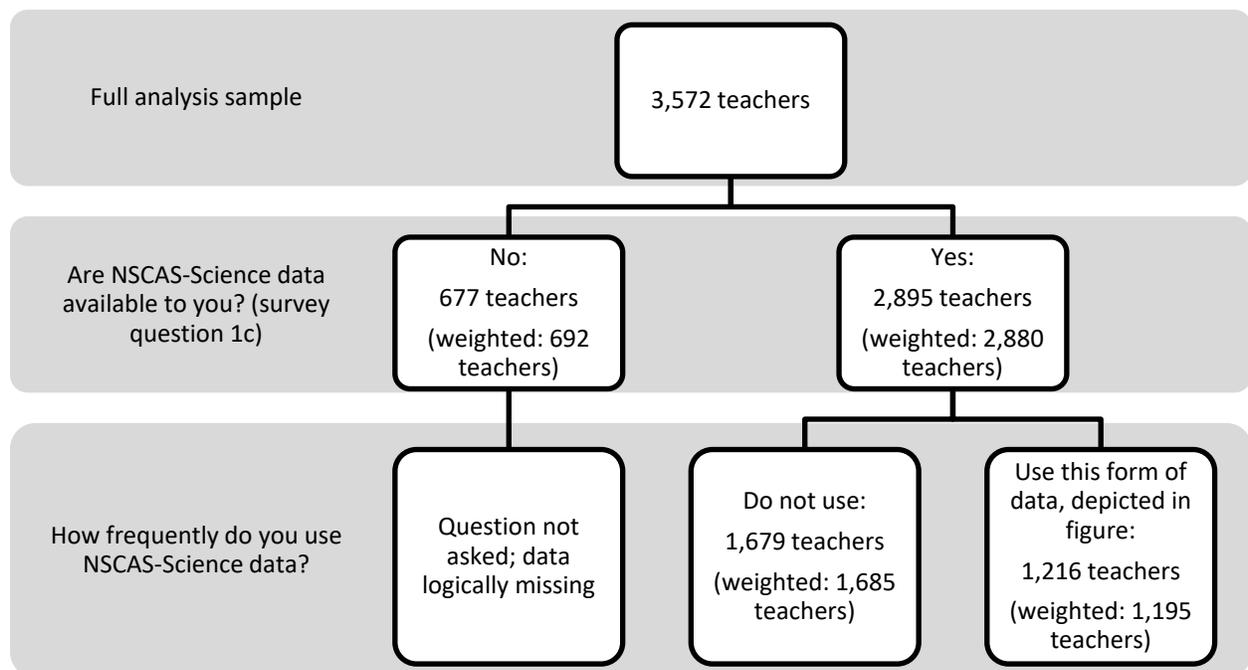
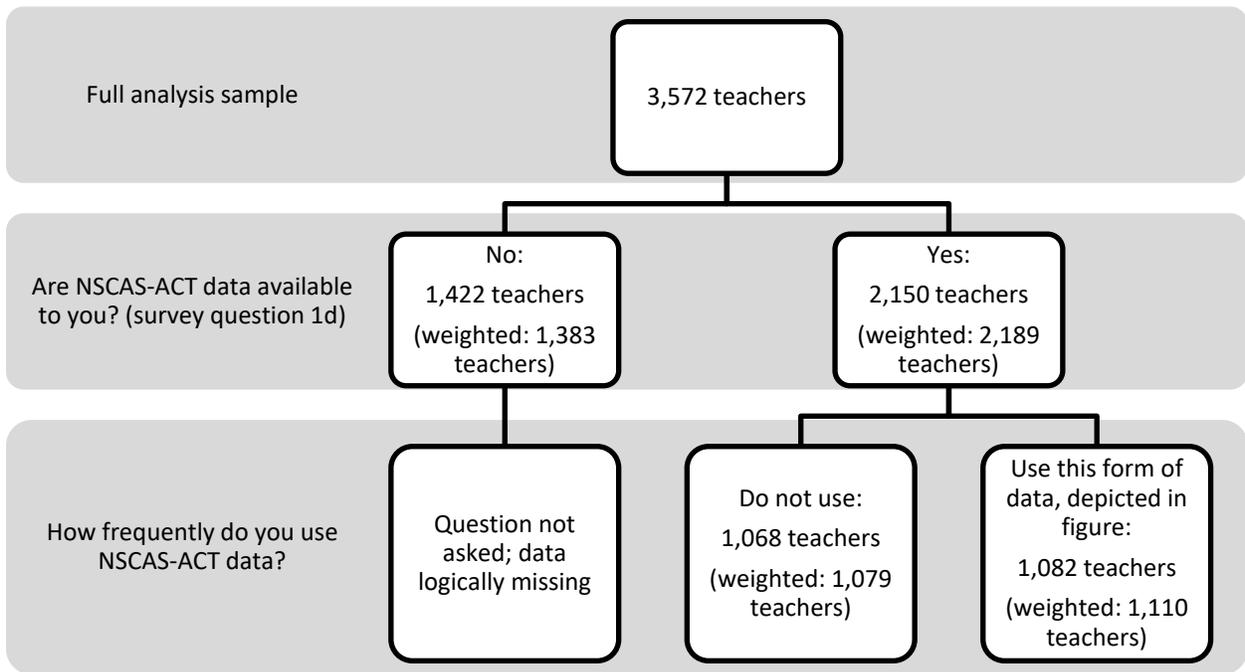


Figure C3. Reasons for reduction in the teacher sample size for frequency of use of NSCAS-Science data (survey question 2c)



**Figure C4. Reasons for reduction in the teacher sample size for frequency of use of NSCAS-
ACT data (survey question 2d)**



**Figure C5. Reasons for reduction in the teacher sample size or frequency of use of ELPA21
data (survey question 2e)**

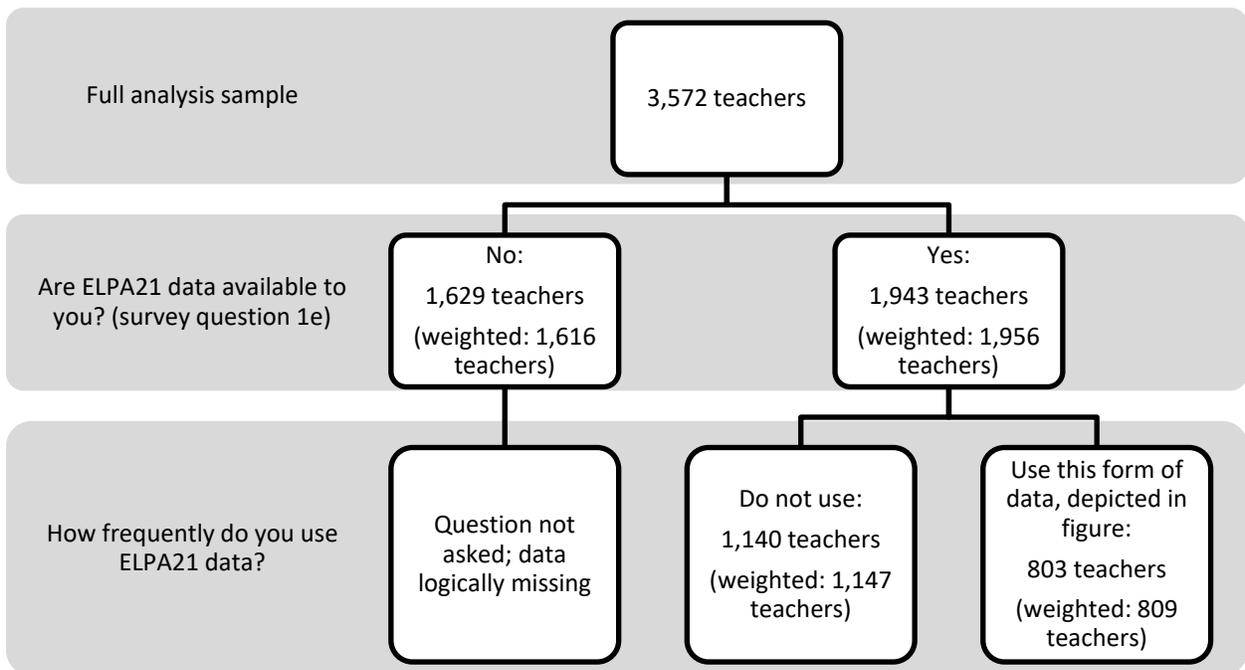


Figure C6. Reasons for reduction in the teacher sample size for frequency of use of the MAP Growth interim assessment data (survey question 2f)

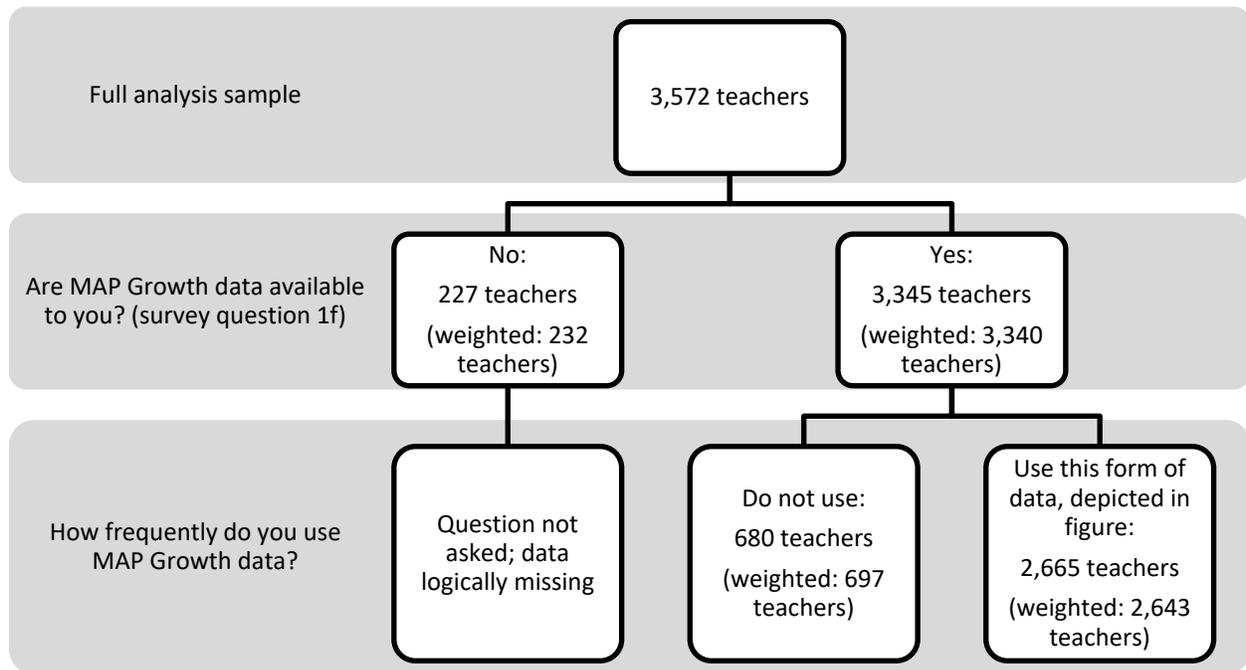


Figure C7. Reasons for reduction in the teacher sample size for frequency of use of formative assessment data (survey question 2g)

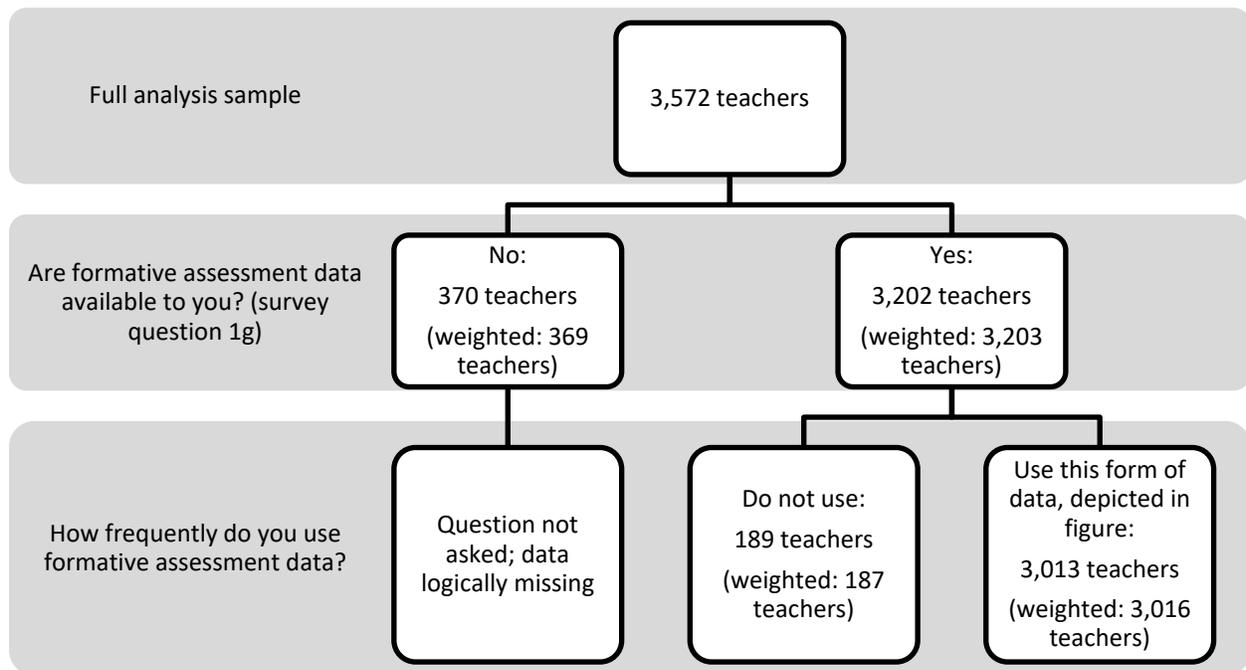


Figure C8. Reasons for reduction in the teacher sample size for usefulness of summative data (composite of survey questions 3a–3e)

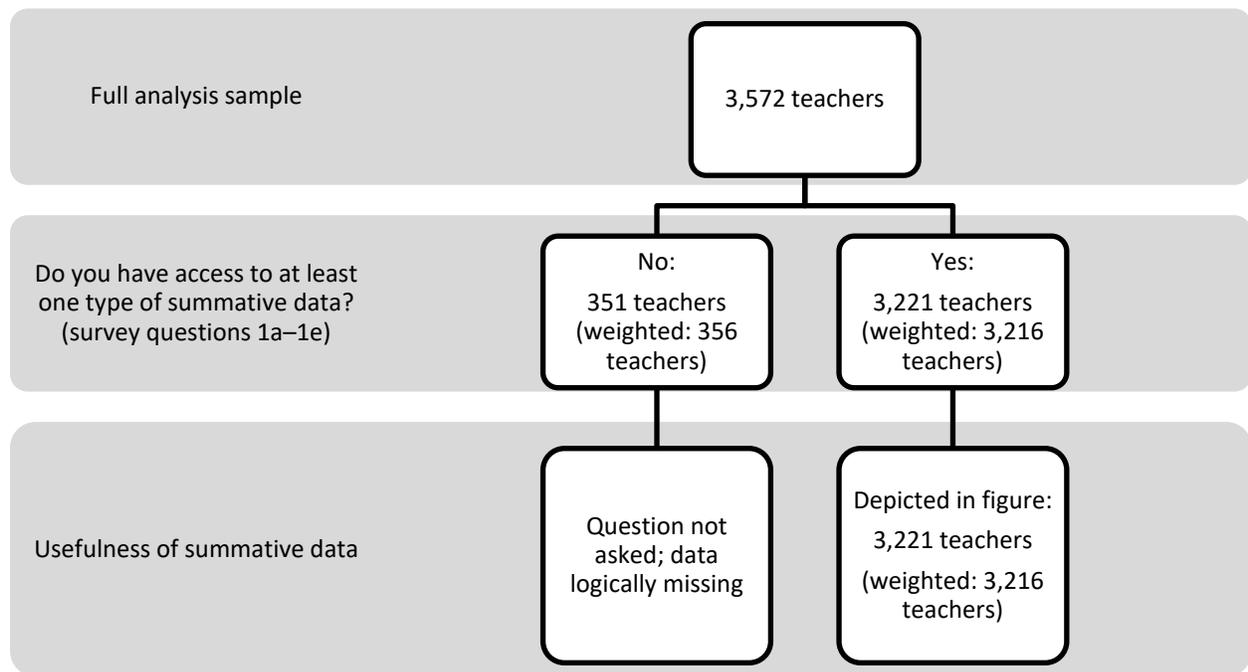


Figure C9. Reasons for the reduction in teacher sample size for usefulness of MAP Growth interim data (survey question 3f)

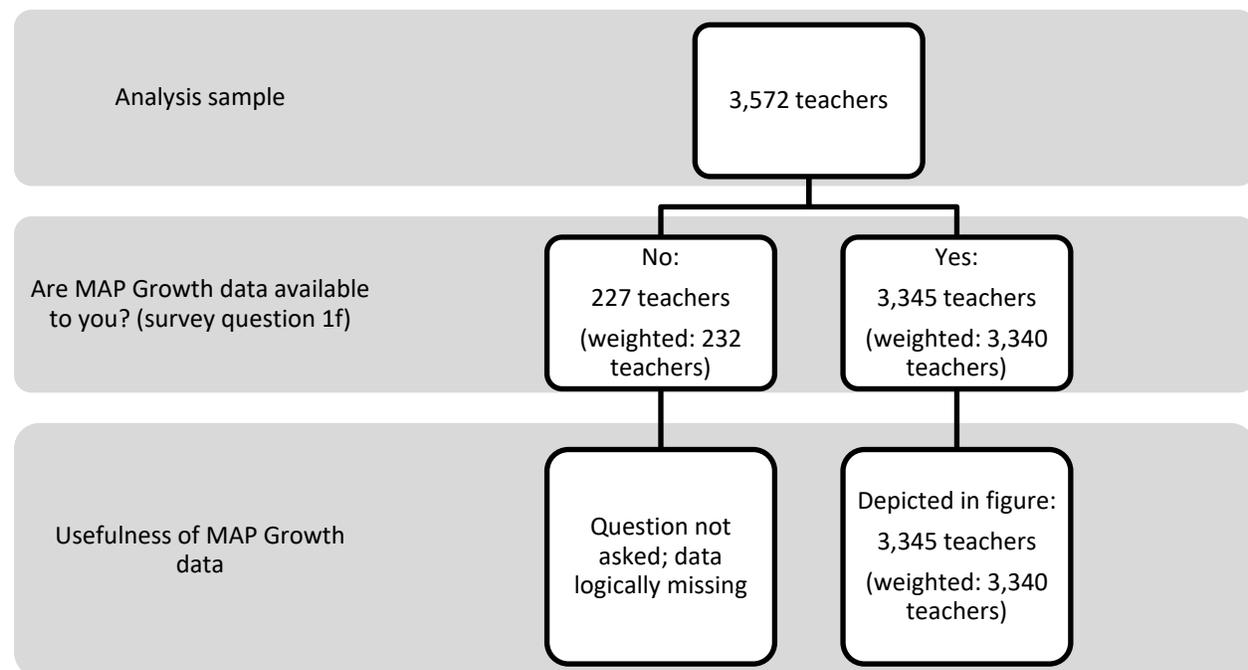


Figure C10. Reasons for reduction in the teacher sample size for usefulness of formative data (survey question 3g)

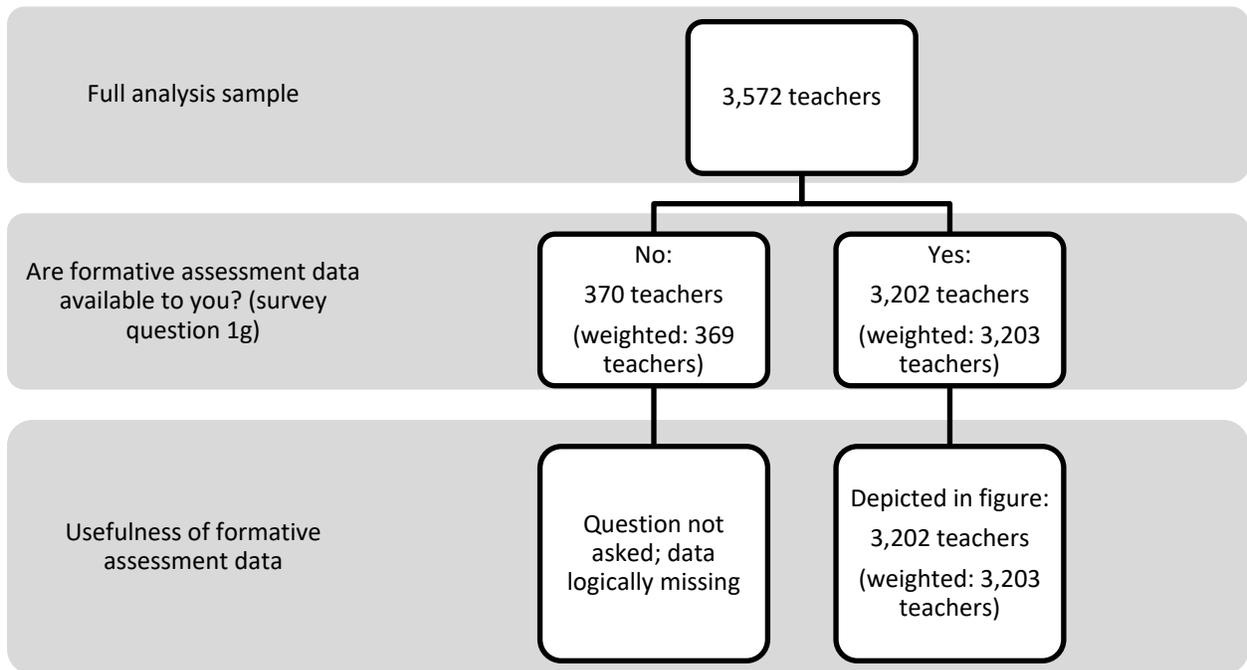


Figure C11. Reasons for reduction in the teacher sample size for actions with summative data (composite of survey questions 4–8)

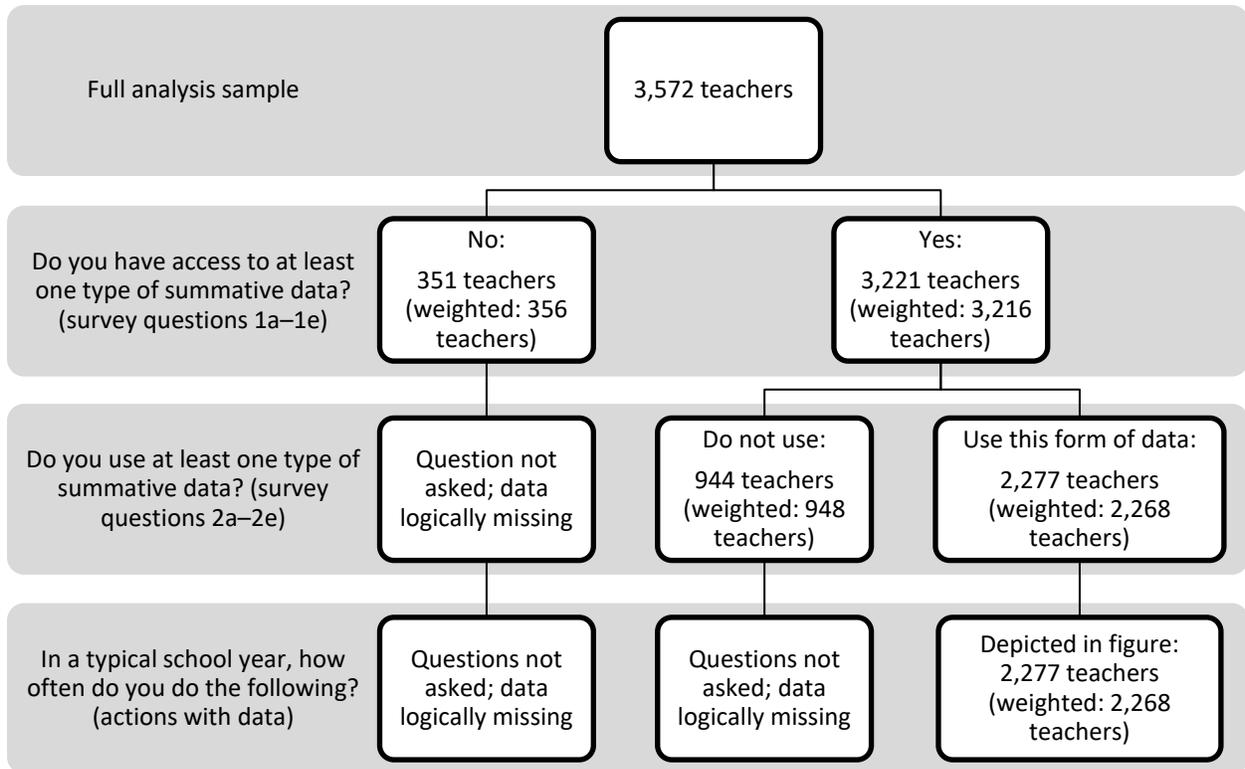


Figure C12. Reasons for reduction in the teacher sample size for actions with MAP Growth interim data (survey question 9)

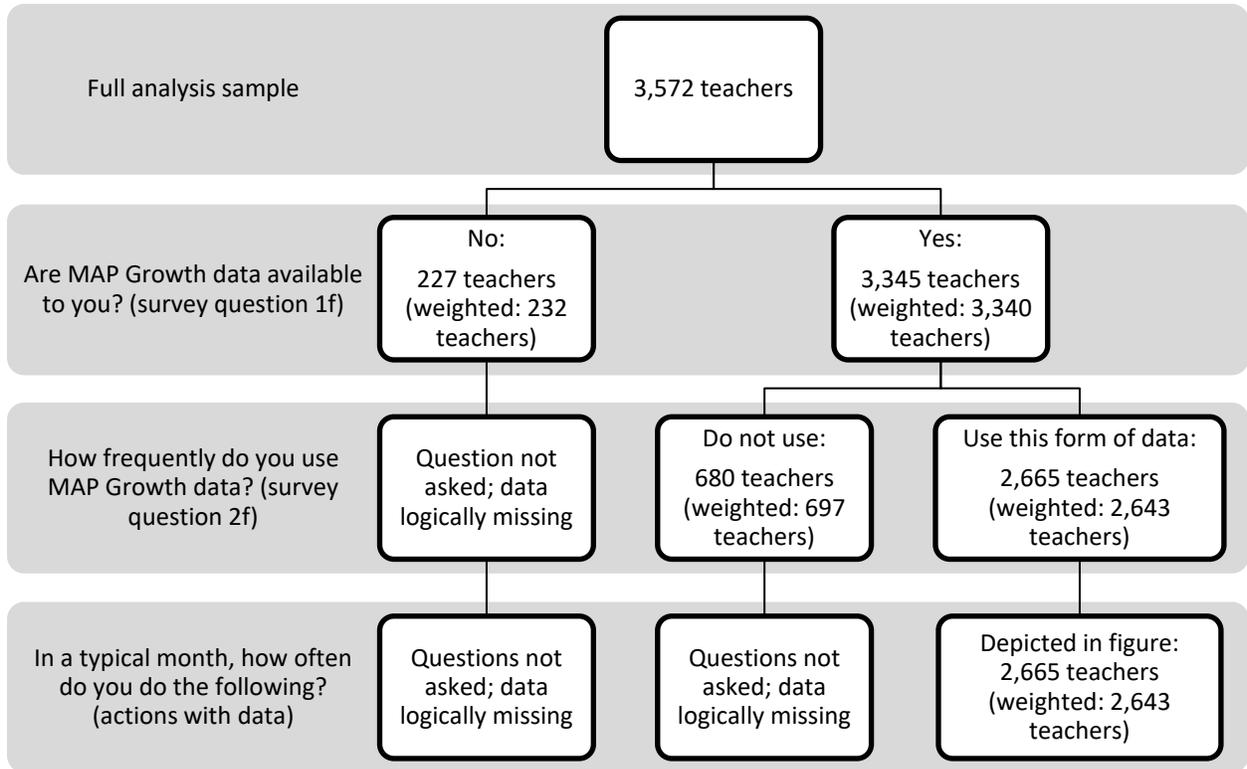


Figure C13. Reasons for reduction in the teacher sample size for actions with formative data (survey question 10)

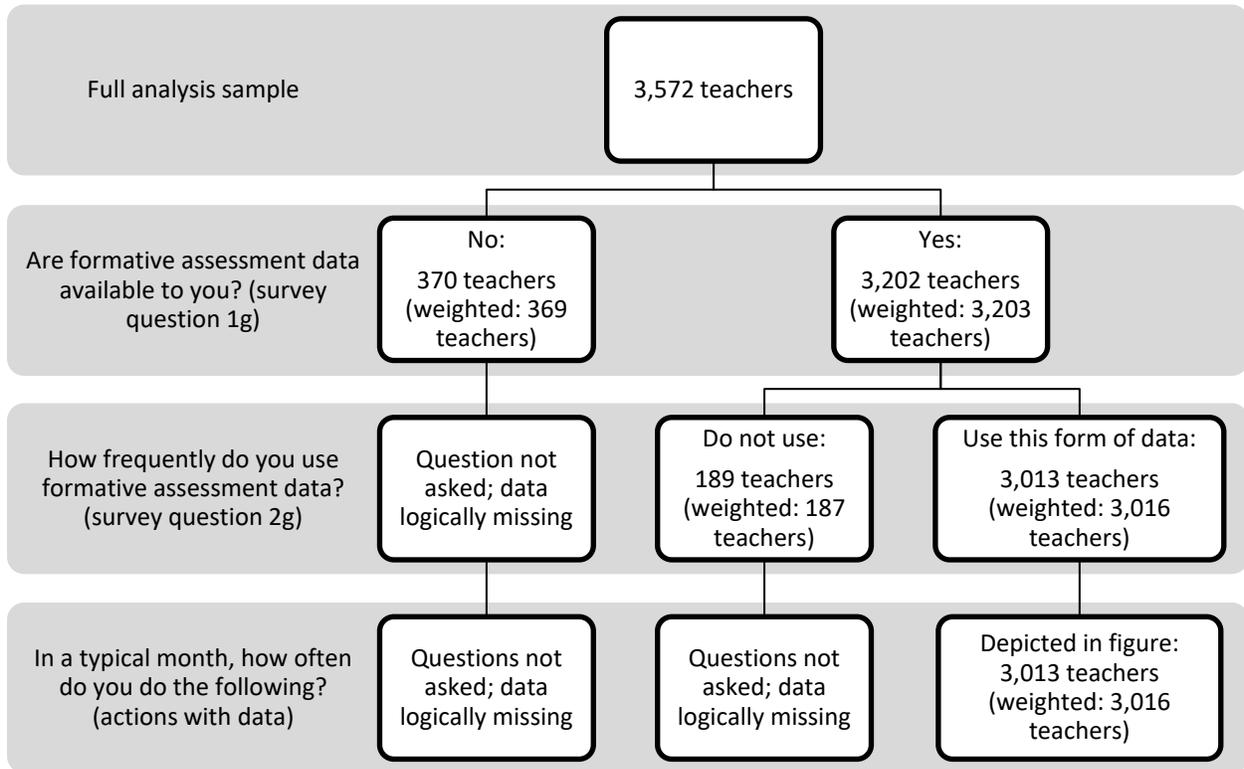


Figure C14. Reasons for reduction in the principal sample size for frequency of use of NSCAS-English Language Arts data (survey question 2a)

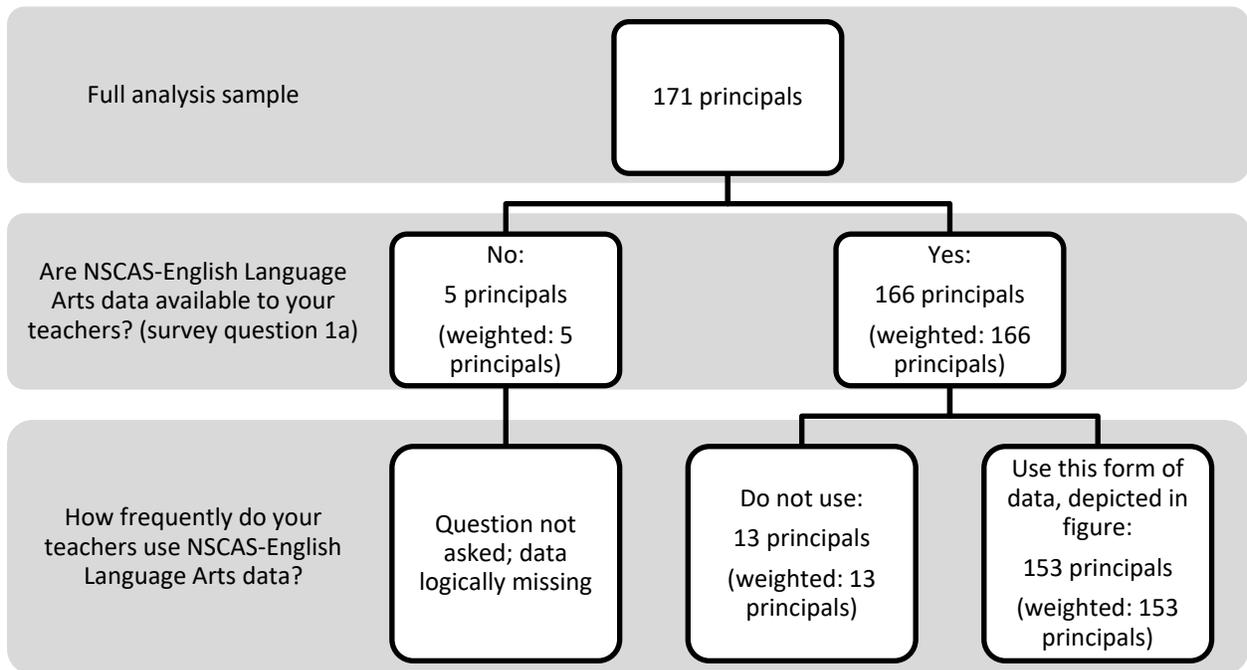


Figure C15. Reasons for reduction in the principal sample size for frequency of use of NSCAS-Mathematics data (survey question 2b)

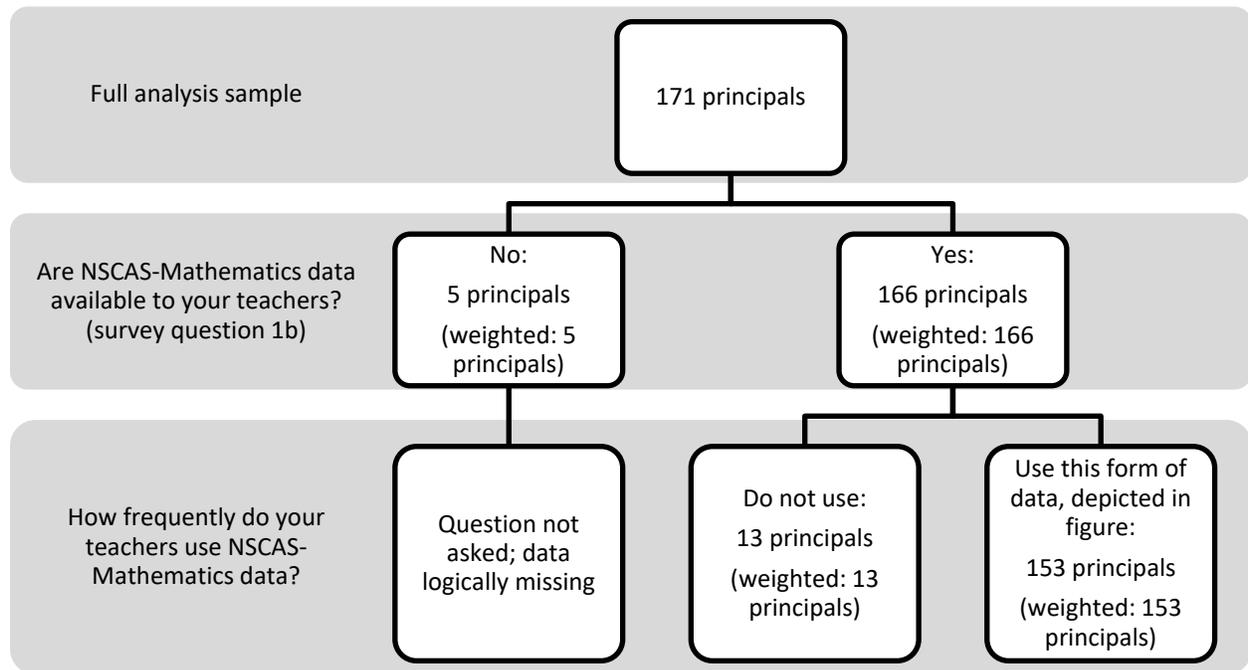
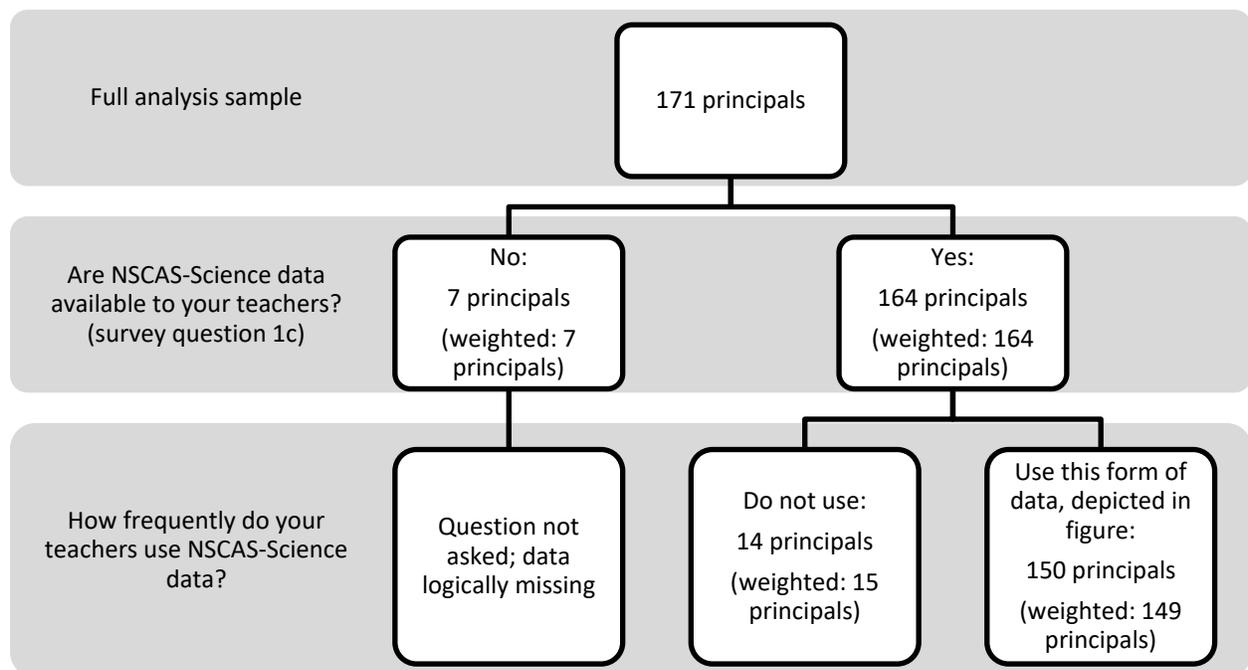
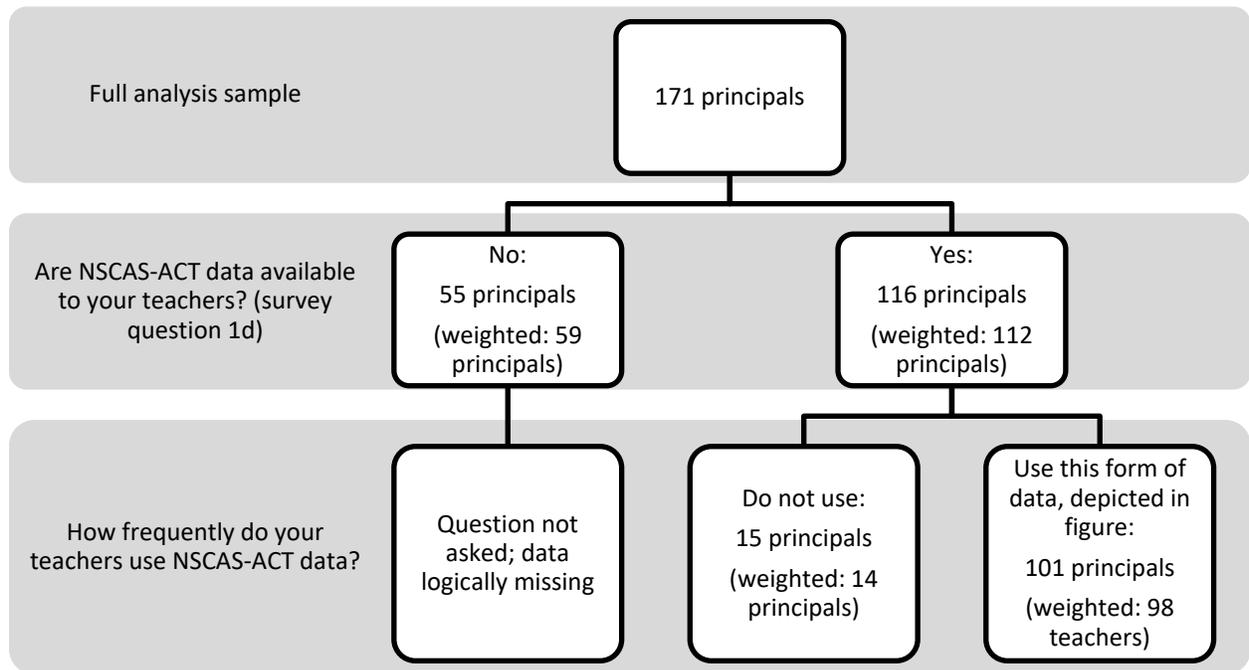


Figure C16. Reasons for reduction in the principal sample size for frequency of use of NSCAS-Science data (survey question 2c)



**Figure C17. Reasons for reduction in the principal sample size for frequency of use of NSCAS-
ACT data (survey question 2d)**



**Figure C18. Reasons for reduction in the principal sample size for frequency of use of ELPA21
data (survey question 2e)**

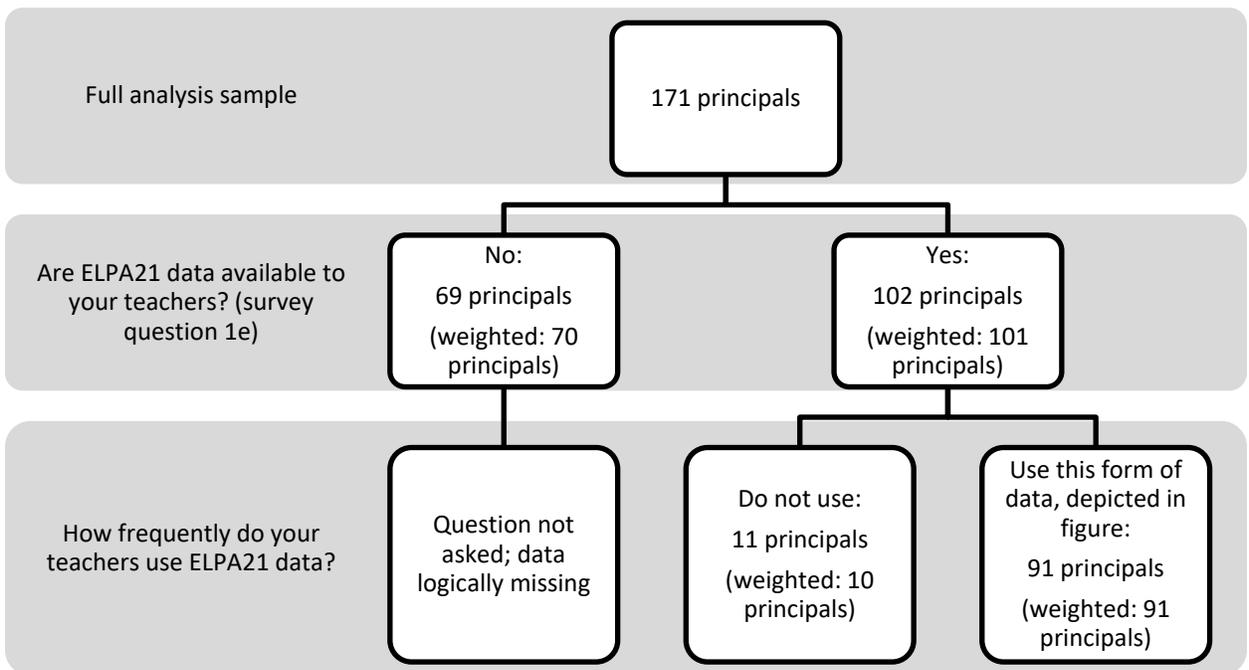


Figure C19. Reasons for reduction in the principal sample size for frequency of use of MAP Growth interim assessment data (survey question 2f)

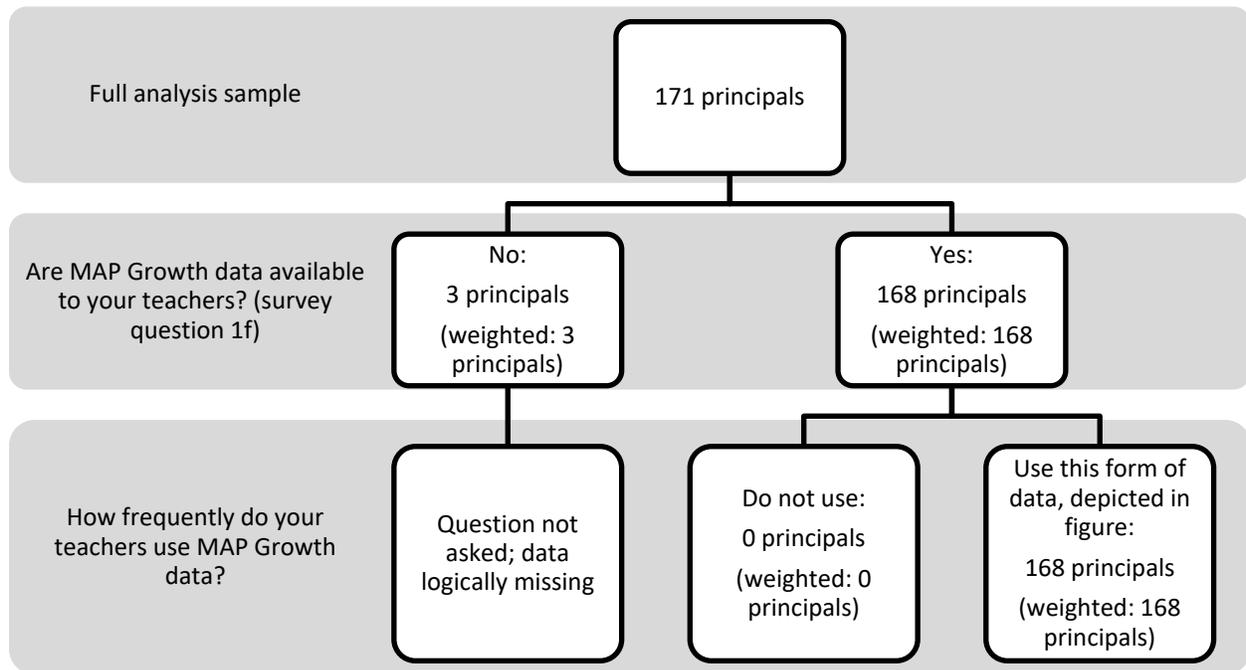


Figure C20. Reasons for reduction in the principal sample size for frequency of use of formative assessment data (survey question 2g)

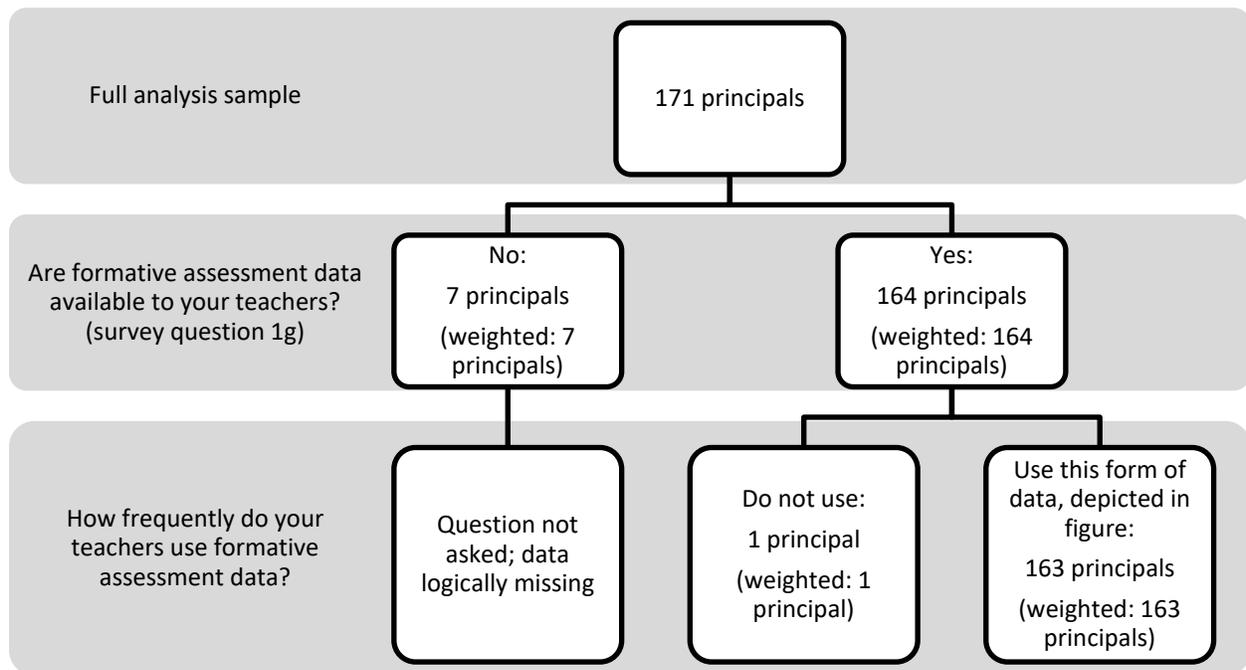


Figure C21. Reasons for reduction in the principal sample size for usefulness of summative data (composite of survey questions 3a–3e)

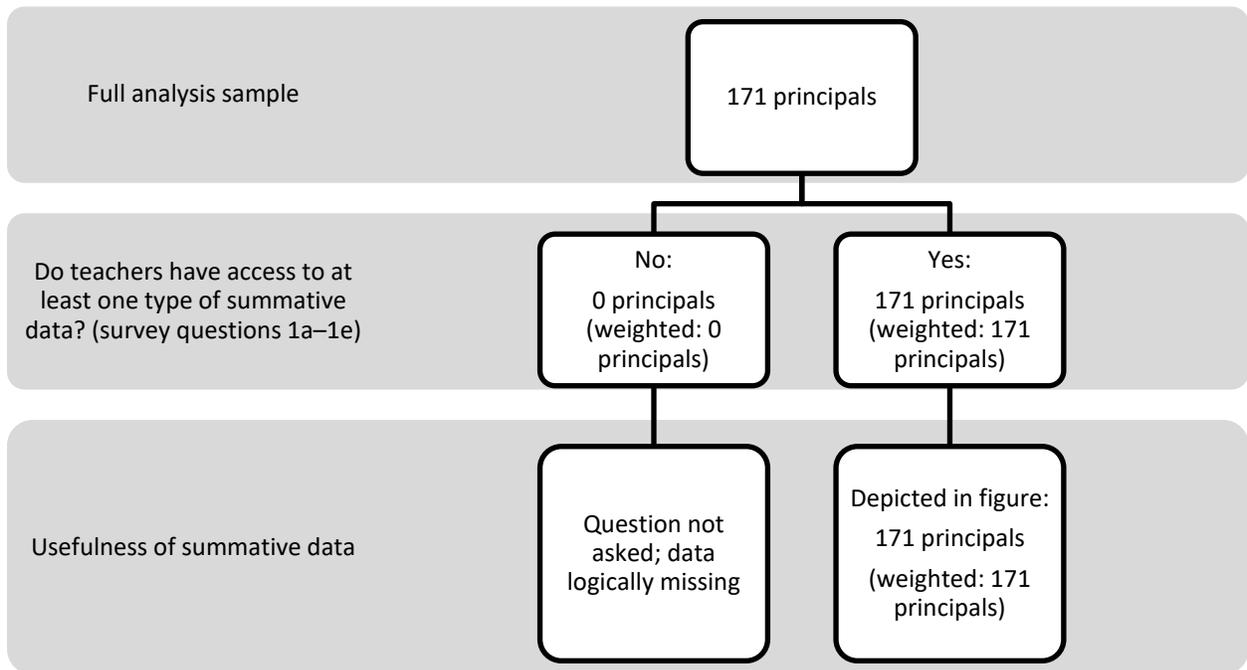


Figure C22. Reasons for reduction in the principal sample size for usefulness of MAP Growth interim data (survey question 3f)

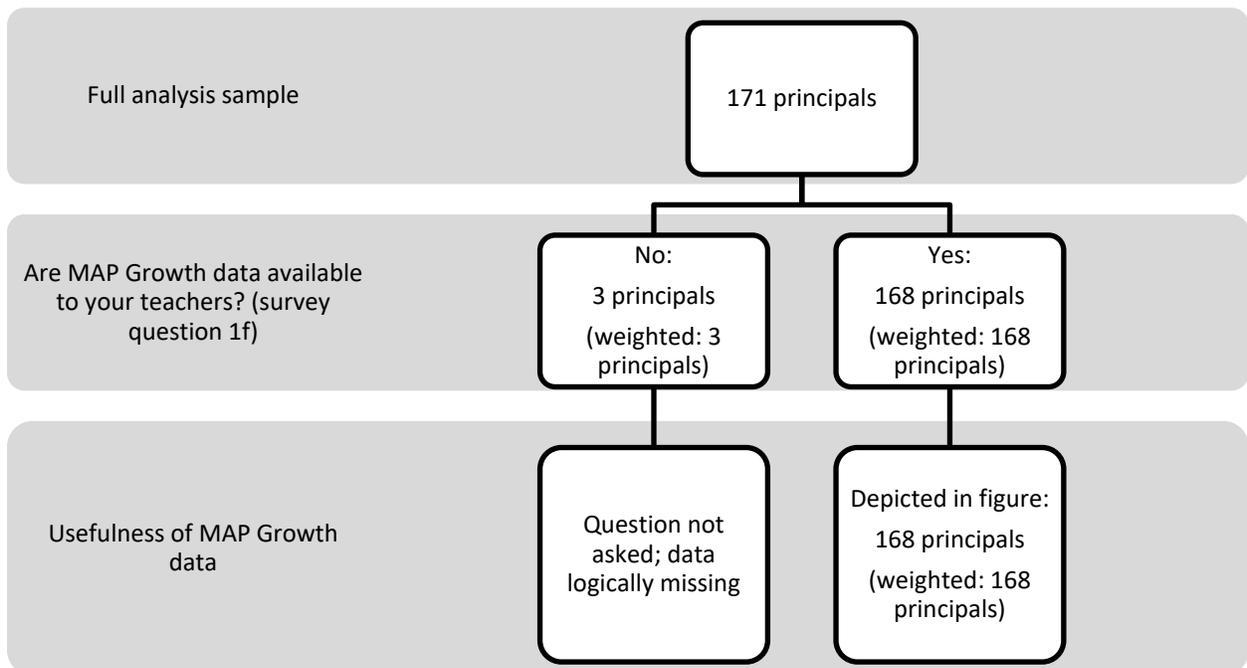


Figure C23. Reasons for reduction in the principal sample size for usefulness of formative assessment data (survey question 3g)

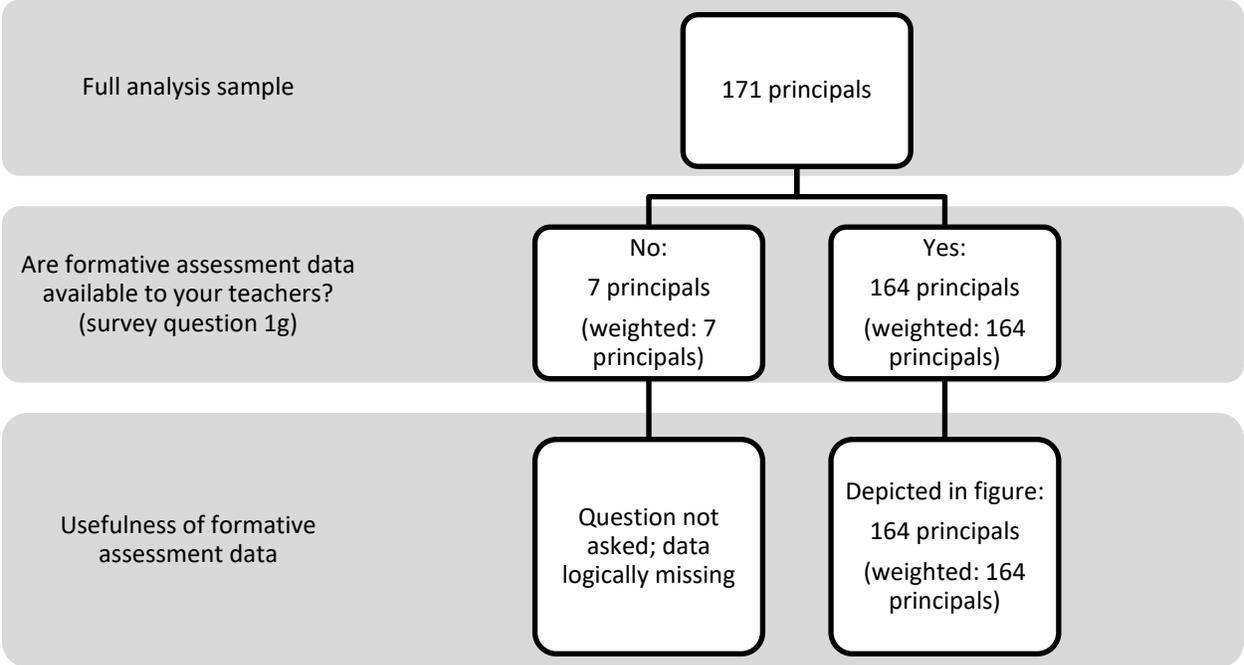


Table C1. Complete results for the hierarchical linear model examining the association between teachers' actions with summative data and their perceptions of their competence in using data, their attitudes toward data, and their perceptions of organizational supports for using data, 2019

Variable	Coefficient	SE
Intercept	1.73***	(0.02)
Competence in using data	0.19***	(0.04)
Attitudes toward data	0.06	(0.04)
Organizational supports for using data	0.20***	(0.04)
<i>School level^a</i>		
Middle school	-0.07	(0.04)
High school	-0.17***	(0.04)
Title I school	0.05	(0.04)
<i>Teacher's highest degree earned^b</i>		
Master's degree	-0.02	(0.03)
More-advanced degree	-0.22	(0.15)
Teacher has special education endorsement	-0.02	(0.04)
Teacher teaches core subject	0.21***	(0.04)
<i>Years of experience in education^c</i>		
5 years or less	0.02	(0.04)
6–12 years	0.05	(0.04)
13–21 years	-0.01	(0.04)

*** Significant at $p < .001$.

Note: $n = 2,277$ teachers in 348 schools. Numbers in parentheses are standard errors. Coefficients are from a two-level multiple regression model that accounted for the nesting of teachers within schools. In this model, competence with data, attitudes toward data, organizational supports, master's degree, more-advanced degree, teacher has special education endorsement, teacher teaches core subject, 5 years or less of experience in education, 6–12 years of experience in education, and 13–21 years of experience in education were all centered around the school mean. Middle school, high school, and Title I school were all centered around the mean for the whole sample.

a. Elementary school was treated as the reference group for school level.

b. Bachelor's degree or lower was treated as the reference group for teacher's highest degree earned.

c. 22 years or more was treated as the reference group for years of experience in education.

Source: Authors' analysis of 2019 data from the Teacher Data Use Survey administered by the Nebraska Department of Education.

Table C2. Complete results for the hierarchical linear model examining the association between teachers' actions with interim data and their perceptions about their competence in using data, their attitudes toward data, and their perceptions of organizational supports for using data, 2019

Variable	Coefficient	SE
Intercept	1.78***	(0.02)
Competence in using data	0.23***	(0.03)
Attitudes toward data	0.08	(0.04)
Organizational supports for using data	0.22***	(0.03)
<i>School level^a</i>		
Middle school	-0.22***	(0.05)
High school	-0.46***	(0.05)
Title I school	0.01	(0.04)
<i>Teacher's highest degree earned^b</i>		
Master's degree	0.02	(0.03)
More-advanced degree	-0.13	(0.18)
Teacher has special education endorsement	0.04	(0.03)
Teacher teaches core subject	0.16***	(0.03)
<i>Years of experience in education^c</i>		
5 years or less	0.16***	(0.04)
6–12 years	0.09	(0.04)
13–21 years	0.04	(0.04)

*** Significant at $p < .001$.

Note: $n = 2,665$ teachers in 350 schools. Numbers in parentheses are standard errors. Coefficients are from a two-level multiple regression model that accounted for the nesting of teachers within schools. In this model, competence with data, attitudes toward data, organizational supports, master's degree, more-advanced degree, teacher has special education endorsement, teacher teaches core subject, 5 years or less of experience in education, 6–12 years of experience in education, and 13–21 years of experience in education were all centered around the school mean. Middle school, high school, and Title I school were all centered around the mean for the whole sample.

a. Elementary school was treated as the reference group for school level.

b. Bachelor's degree or lower was treated as the reference group for teacher's highest degree earned.

c. 22 years or more was treated as the reference group for years of experience in education.

Source: Authors' analysis of 2019 data from the Teacher Data Use Survey administered by the Nebraska Department of Education.

Table C3. Complete results for the hierarchical linear model examining the association between teachers' actions with formative data and their perceptions about their competence in using data, their attitudes toward data, and their perceptions of organizational supports for using data, 2019

Variable	Coefficient	SE
Intercept	2.46***	(0.02)
Competence in using data	0.30***	(0.03)
Attitudes toward data	0.13***	(0.03)
Organizational supports for using data	0.14***	(0.03)
<i>School level^a</i>		
Middle school	-0.21***	(0.05)
High school	-0.33***	(0.05)
Title I school	-0.07	(0.05)
<i>Teacher's highest degree earned^b</i>		
Master's degree	0.02	(0.03)
More-advanced degree	-0.17	(0.15)
Teacher has special education endorsement	-0.08	(0.03)
Teacher teaches core subject	0.25***	(0.03)
<i>Years of experience in education^c</i>		
5 years or less	0.30***	(0.04)
6–12 years	0.22***	(0.04)
13–21 years	0.06	(0.04)

*** Significant at $p < .001$.

Note: $n = 3,013$ teachers in 351 schools. Numbers in parentheses are standard errors. Coefficients are from a two-level multiple regression model that accounted for the nesting of teachers within schools. In this model, competence with data, attitudes toward data, organizational supports, master's degree, more-advanced degree, teacher has special education endorsement, teacher teaches core subject, 5 years or less of experience in education, 6–12 years of experience in education, and 13–21 years of experience in education were all centered around the school mean. Middle school, high school, and Title I school were all centered around the mean for the whole sample.

a. Elementary school was treated as the reference group for school level.

b. Bachelor's degree or lower was treated as the reference group for teacher's highest degree earned.

c. 22 years or more was treated as the reference group for years of experience in education.

Source: Authors' analysis of 2019 data from the Teacher Data Use Survey administered by the Nebraska Department of Education.

Table C4. Complete results for the hierarchical linear model examining the association between teachers' characteristics and their perceived competence with data, 2019

Variable	Coefficient	SE
Intercept	2.92***	(0.01)
<i>School level^a</i>		
Middle school	-0.26***	(0.03)
High school	-0.27***	(0.03)
Title I school	-0.01	(0.03)
<i>Teacher's highest degree earned^b</i>		
Master's degree	0.08***	(0.02)
More-advanced degree	0.27	(0.11)
Teacher has special education endorsement	0.13***	(0.02)
Teacher teaches core subject	-0.01	(0.02)
<i>Years of experience in education^c</i>		
5 years or less	0.05	(0.03)
6–12 years	0.05	(0.03)
13–21 years	0.01	(0.03)

*** Significant at $p < .001$.

Note: $n = 3,572$ teachers in 353 schools. Numbers in parentheses are standard errors. Coefficients are from a two-level multiple regression model that accounted for the nesting of teachers within schools. In this model, master's degree, more-advanced degree, teacher has special education endorsement, teacher teaches core subject, 5 years or less of experience in education, 6–12 years of experience in education, and 13–21 years of experience in education were all centered around the school mean. Middle school, high school, and Title I school were all centered around the mean for the whole sample.

a. Elementary school was treated as the reference group for school level.

b. Bachelor's degree or lower was treated as the reference group for teacher's highest degree earned.

c. 22 years or more was treated as the reference group for years of experience in education.

Source: Authors' analysis of 2019 survey and administrative data from the Teacher Data Use Survey and the Nebraska Department of Education.

Table C5. Complete results for the hierarchical linear model examining the association between teachers' characteristics and their attitudes toward data, 2019

Variable	Coefficient	SE
Intercept	3.10***	(0.01)
<i>School level^a</i>		
Middle school	-0.24***	(0.03)
High school	-0.23***	(0.03)
Title I school	0.00	(0.03)
<i>Teacher's highest degree earned^b</i>		
Master's degree	0.06**	(0.02)
More-advanced degree	0.26	(0.10)
Teacher has special education endorsement	0.12***	(0.02)
Teacher teaches core subject	0.04	(0.02)
<i>Years of experience in education^c</i>		
5 years or less	0.14***	(0.03)
6–12 years	0.07**	(0.02)
13–21 years	0.00	(0.02)

** Significant at $p < .01$; *** Significant at $p < .001$.

Note: $n = 3,572$ teachers in 353 schools. Numbers in parentheses are standard errors. Coefficients are from a two-level multiple regression model that accounted for the nesting of teachers within schools. In this model, master's degree, more-advanced degree, teacher has special education endorsement, teacher teaches core subject, 5 years or less of experience in education, 6–12 years of experience in education, and 13–21 years of experience in education were all centered around the school mean. Middle school, high school, and Title I school were all centered around the mean for the whole sample.

a. Elementary school was treated as the reference group for school level.

b. Bachelor's degree or lower was treated as the reference group for teacher's highest degree earned.

c. 22 years or more was treated as the reference group for years of experience in education.

Source: Authors' analysis of 2019 survey and administrative data from the Teacher Data Use Survey and the Nebraska Department of Education.

Table C6. Complete results for the hierarchical linear model examining the association between teachers' characteristics and their perceptions of organizational supports for using data, 2019

Variable	Coefficient	SE
Intercept	2.97***	(0.01)
<i>School level^a</i>		
Middle school	-0.19***	(0.04)
High school	-0.25***	(0.04)
Title I school	-0.05	(0.03)
<i>Teacher's highest degree earned^b</i>		
Master's degree	0.01	(0.02)
More-advanced degree	-0.01	(0.10)
Teacher has special education endorsement	0.04	(0.02)
Teacher teaches core subject	-0.06**	(0.02)
<i>Years of experience in education^c</i>		
5 years or less	-0.01	(0.03)
6–12 years	-0.03	(0.02)
13–21 years	-0.03	(0.02)

** Significant at $p < .01$; *** Significant at $p < .001$.

Note: $n = 3,572$ teachers in 353 schools. Numbers in parentheses are standard errors. Coefficients are from a two-level multiple regression model that accounted for the nesting of teachers within schools. In this model, master's degree, more-advanced degree, teacher has special education endorsement, teacher teaches core subject, 5 years or less of experience in education, 6–12 years of experience in education, and 13–21 years of experience in education were all centered around the school mean. Middle school, high school, and Title I school were all centered around the mean for the whole sample.

a. Elementary school was treated as the reference group for school level.

b. Bachelor's degree or lower was treated as the reference group for teacher's highest degree earned.

c. 22 years or more was treated as the reference group for years of experience in education.

Source: Authors' analysis of 2019 survey and administrative data from the Teacher Data Use Survey and the Nebraska Department of Education.

Table C7. Complete results for the hierarchical linear model examining the association between teachers' characteristics and their actions with summative data, 2019

Variable	Coefficient	SE
Intercept	1.73***	(0.02)
<i>School level^a</i>		
Middle school	-0.07	(0.04)
High school	-0.17***	(0.04)
Title I school	0.04	(0.04)
<i>Teacher's highest degree earned^b</i>		
Master's degree	0.00	(0.03)
More-advanced degree	-0.14	(0.16)
Teacher has special education endorsement	0.01	(0.04)
Teacher teaches core subject	0.18***	(0.04)
<i>Years of experience in education^c</i>		
5 years or less	0.04	(0.05)
6–12 years	0.07	(0.04)
13–21 years	-0.01	(0.04)

*** Significant at $p < .001$.

Note: $n = 2,277$ teachers in 348 schools. Numbers in parentheses are standard errors. Coefficients are from a two-level multiple regression model that accounted for the nesting of teachers within schools. In this model, master's degree, more-advanced degree, teacher has special education endorsement, teacher teaches core subject, 5 years or less of experience in education, 6–12 years of experience in education, and 13–21 years of experience in education were all centered around the school mean. Middle school, high school, and Title I school were all centered around the mean for the whole sample.

a. Elementary school was treated as the reference group for school level.

b. Bachelor's degree or lower was treated as the reference group for teacher's highest degree earned.

c. 22 years or more was treated as the reference group for years of experience in education.

Source: Authors' analysis of 2019 survey and administrative data from the Teacher Data Use Survey and the Nebraska Department of Education.

Table C8. Complete results for the hierarchical linear model examining the association between teachers' characteristics and their actions with interim data, 2019

Variable	Coefficient	SE
Intercept	1.78***	(0.02)
<i>School level^a</i>		
Middle school	-0.23***	(0.05)
High school	-0.46***	(0.05)
Title I school	0.01	(0.04)
<i>Teacher's highest degree earned^b</i>		
Master's degree	0.05	(0.03)
More-advanced degree	-0.08	(0.18)
Teacher has special education endorsement	0.08	(0.03)
Teacher teaches core subject	0.12***	(0.04)
<i>Years of experience in education^c</i>		
5 years or less	0.18***	(0.04)
6–12 years	0.10	(0.04)
13–21 years	0.04	(0.04)

*** Significant at $p < .001$.

Note: $n = 2,665$ teachers in 350 schools. Numbers in parentheses are standard errors. Coefficients are from a two-level multiple regression model that accounted for the nesting of teachers within schools. In this model, master's degree, more-advanced degree, teacher has special education endorsement, teacher teaches core subject, 5 years or less of experience in education, 6–12 years of experience in education, and 13–21 years of experience in education were all centered around the school mean. Middle school, high school, and Title I school were all centered around the mean for the whole sample.

a. Elementary school was treated as the reference group for school level.

b. Bachelor's degree or lower was treated as the reference group for teacher's highest degree earned.

c. 22 years or more was treated as the reference group for years of experience in education.

Source: Authors' analysis of 2019 survey and administrative data from the Teacher Data Use Survey and the Nebraska Department of Education.

Table C9. Complete results for the hierarchical linear model examining the association between teachers' characteristics and their actions with formative data, 2019

Variable	Coefficient	SE
Intercept	2.46***	(0.02)
<i>School level^a</i>		
Middle school	-0.20***	(0.05)
High school	-0.32***	(0.05)
Title I school	-0.07	(0.05)
<i>Teacher's highest degree earned^b</i>		
Master's degree	0.05	(0.03)
More-advanced degree	-0.06	(0.16)
Teacher has special education endorsement	-0.02	(0.03)
Teacher teaches core subject	0.23***	(0.03)
<i>Years of experience in education^c</i>		
5 years or less	0.33***	(0.04)
6–12 years	0.24**	(0.04)
13–21 years	0.06	(0.04)

** Significant at $p < .01$; *** Significant at $p < .001$.

Note: $n = 3,013$ teachers in 351 schools. Numbers in parentheses are standard errors. Coefficients are from a two-level multiple regression model that accounted for the nesting of teachers within schools. In this model, master's degree, more-advanced degree, teacher has special education endorsement, teacher teaches core subject, 5 years or less of experience in education, 6–12 years of experience in education, and 13–21 years of experience in education were all centered around the school mean. Middle school, high school, and Title I school were all centered around the mean for the whole sample.

a. Elementary school was treated as the reference group for school level.

b. Bachelor's degree or lower was treated as the reference group for teacher's highest degree earned.

c. 22 years or more was treated as the reference group for years of experience in education.

Source: Authors' analysis of 2019 survey and administrative data from the Teacher Data Use Survey and the Nebraska Department of Education.

Table C10. Complete results for the hierarchical linear model examining the association between school accountability classifications and teachers' perceived competence with data, 2019

Variable	Coefficient	SE
Intercept	2.92***	(0.01)
<i>School accountability classification^a</i>		
Good	0.00	(0.03)
Great	0.03	(0.04)
Excellent	0.01	(0.04)
<i>School level^b</i>		
Middle school	-0.25***	(0.03)
High school	-0.27***	(0.03)
Title I school	0.00	(0.03)
<i>Teacher's highest degree earned^c</i>		
Master's degree	0.08***	(0.02)
More-advanced degree	0.27	(0.11)
Teacher has special education endorsement	0.13***	(0.02)
Teacher teaches core subject	-0.01	(0.02)
<i>Years of experience in education^d</i>		
5 years or less	0.05	(0.03)
6–12 years	0.05	(0.03)
13–21 years	0.01	(0.03)

*** Significant at $p < .001$.

Note: $n = 3,572$ teachers in 353 schools. Numbers in parentheses are standard errors. Coefficients are from a two-level multiple regression model that accounted for the nesting of teachers within schools. In this model, master's degree, more-advanced degree, teacher has special education endorsement, teacher teaches core subject, 5 years or less of experience in education, 6–12 years of experience in education, and 13–21 years of experience in education were all centered around the school mean. *Good, great, excellent*, middle school, high school, and Title I school were all centered around the mean for the whole sample.

a. *Needs improvement* was treated as the reference group for school accountability classification.

b. Elementary school was treated as the reference group for school level.

c. Bachelor's degree or lower was treated as the reference group for teacher's highest degree earned.

d. 22 years or more was treated as the reference group for years of experience in education.

Source: Authors' analysis of 2019 survey and administrative data from the Teacher Data Use Survey and the Nebraska Department of Education.

Table C11. Complete results for the hierarchical linear model examining the association between school accountability classifications and teachers' attitudes toward data, 2019

Variable	Coefficient	SE
Intercept	3.10***	(0.01)
<i>School accountability classification^a</i>		
Good	-0.01	(0.03)
Great	-0.01	(0.03)
Excellent	0.00	(0.03)
<i>School level^b</i>		
Middle school	-0.24***	(0.03)
High school	-0.23***	(0.03)
Title I school	0.00	(0.03)
<i>Teacher's highest degree earned^c</i>		
Master's degree	0.06**	(0.02)
More-advanced degree	0.26	(0.10)
Teacher has special education endorsement	0.12***	(0.02)
Teacher teaches core subject	0.04	(0.02)
<i>Years of experience in education^d</i>		
5 years or less	0.14***	(0.03)
6–12 years	0.07**	(0.02)
13–21 years	0.00	(0.02)

** Significant at $p < .01$; *** Significant at $p < .001$.

Note: $n = 3,572$ teachers in 353 schools. Numbers in parentheses are standard errors. Coefficients are from a two-level multiple regression model that accounted for the nesting of teachers within schools. In this model, master's degree, more-advanced degree, teacher has special education endorsement, teacher teaches core subject, 5 years or less of experience in education, 6–12 years of experience in education, and 13–21 years of experience in education were all centered around the school mean. *Good, great, excellent*, middle school, high school, and Title I school were all centered around the mean for the whole sample.

a. *Needs improvement* was treated as the reference group for school accountability classification.

b. Elementary school was treated as the reference group for school level.

c. Bachelor's degree or lower was treated as the reference group for teacher's highest degree earned.

d. 22 years or more was treated as the reference group for years of experience in education.

Source: Authors' analysis of 2019 survey and administrative data from the Teacher Data Use Survey and the Nebraska Department of Education.

Table C12. Complete results for the hierarchical linear model examining the association between school accountability classifications and teachers' perceptions of organizational supports for using data, 2019

Variable	Coefficient	SE
Intercept	2.97***	(0.01)
<i>School accountability classification^a</i>		
Good	0.05	(0.04)
Great	0.10**	(0.04)
Excellent	0.09	(0.04)
<i>School level^b</i>		
Middle school	-0.17***	(0.04)
High school	-0.24***	(0.04)
Title I school	-0.02	(0.03)
<i>Teacher's highest degree earned^c</i>		
Master's degree	0.01	(0.02)
More-advanced degree	-0.01	(0.10)
Teacher has special education endorsement	0.04	(0.02)
Teacher teaches core subject	-0.06**	(0.02)
<i>Years of experience in education^d</i>		
5 years or less	-0.01	(0.03)
6–12 years	-0.03	(0.02)
13–21 years	-0.03	(0.02)

** Significant at $p < .01$; *** Significant at $p < .001$.

Note: $n = 3,572$ teachers in 353 schools. Numbers in parentheses are standard errors. Coefficients are from a two-level multiple regression model that accounted for the nesting of teachers within schools. In this model, master's degree, more-advanced degree, teacher has special education endorsement, teacher teaches core subject, 5 years or less of experience in education, 6–12 years of experience in education, and 13–21 years of experience in education were all centered around the school mean. *Good, great, excellent*, middle school, high school, and Title I school were all centered around the mean for the whole sample.

a. *Needs improvement* was treated as the reference group for school accountability classification.

b. Elementary school was treated as the reference group for school level.

c. Bachelor's degree or lower was treated as the reference group for teacher's highest degree earned.

d. 22 years or more was treated as the reference group for years of experience in education.

Source: Authors' analysis of 2019 survey and administrative data from the Teacher Data Use Survey and the Nebraska Department of Education.

Table C13. Complete results for the hierarchical linear model examining the association between school accountability classifications and teachers' actions with summative data, 2019

Variable	Coefficient	SE
Intercept	1.73**	(0.02)
<i>School accountability classification^a</i>		
Good	-0.04	(0.04)
Great	0.00	(0.04)
Excellent	0.03	(0.05)
<i>School level^b</i>		
Middle school	-0.06	(0.04)
High school	-0.16***	(0.04)
Title I school	0.05	(0.04)
<i>Teacher's highest degree earned^c</i>		
Master's degree	0.00	(0.03)
More-advanced degree	-0.14	(0.16)
Teacher has special education endorsement	0.01	(0.04)
Teacher teaches core subject	0.18***	(0.04)
<i>Years of experience in education^d</i>		
5 years or less	0.04	(0.05)
6–12 years	0.07	(0.04)
13–21 years	-0.01	(0.04)

*** Significant at $p < .001$.

Note: $n = 2,277$ teachers in 348 schools. Numbers in parentheses are standard errors. Coefficients are from a two-level multiple regression model that accounted for the nesting of teachers within schools. In this model, master's degree, more-advanced degree, teacher has special education endorsement, teacher teaches core subject, 5 years or less of experience in education, 6–12 years of experience in education, and 13–21 years of experience in education were all centered around the school mean. *Good, great, excellent*, middle school, high school, and Title I school were all centered around the mean for the whole sample.

a. *Needs improvement* was treated as the reference group for school accountability classification.

b. Elementary school was treated as the reference group for school level.

c. Bachelor's degree or lower was treated as the reference group for teacher's highest degree earned.

d. 22 years or more was treated as the reference group for years of experience in education.

Source: Authors' analysis of 2019 survey and administrative data from the Teacher Data Use Survey and the Nebraska Department of Education.

Table C14. Complete results for the hierarchical linear model examining the association between school accountability classifications and teachers' actions with interim data, 2019

Variable	Coefficient	SE
Intercept	1.77***	(0.02)
<i>School accountability classification^a</i>		
Good	-0.06	(0.05)
Great	-0.11	(0.05)
Excellent	-0.11	(0.05)
<i>School level^b</i>		
Middle school	-0.24***	(0.04)
High school	-0.48***	(0.05)
Title I school	-0.03	(0.04)
<i>Teacher's highest degree earned^c</i>		
Master's degree	0.05	(0.03)
More-advanced degree	-0.08	(0.18)
Teacher has special education endorsement	0.08	(0.03)
Teacher teaches core subject	0.12***	(0.04)
<i>Years of experience in education^d</i>		
5 years or less	0.18***	(0.04)
6–12 years	0.10	(0.04)
13–21 years	0.04	(0.04)

*** Significant at $p < .001$.

Note: $n = 2,665$ teachers in 350 schools. Numbers in parentheses are standard errors. Coefficients are from a two-level multiple regression model that accounted for the nesting of teachers within schools. In this model, master's degree, more-advanced degree, teacher has special education endorsement, teacher teaches core subject, 5 years or less of experience in education, 6–12 years of experience in education, and 13–21 years of experience in education were all centered around the school mean. *Good, great, excellent*, middle school, high school, and Title I school were all centered around the mean for the whole sample.

a. *Needs improvement* was treated as the reference group for school accountability classification.

b. Elementary school was treated as the reference group for school level.

c. Bachelor's degree or lower was treated as the reference group for teacher's highest degree earned.

d. 22 years or more was treated as the reference group for years of experience in education.

Source: Authors' analysis of 2019 survey and administrative data from the Teacher Data Use Survey and the Nebraska Department of Education.

Table C15. Complete results for the hierarchical linear model examining the association between school accountability classifications and teachers' actions with formative data, 2019

Variable	Coefficient	SE
Intercept	2.46***	(0.02)
<i>School accountability classification^a</i>		
Good	-0.07	(0.05)
Great	-0.08	(0.06)
Excellent	-0.14	(0.06)
<i>School level^b</i>		
Middle school	-0.22***	(0.05)
High school	-0.35***	(0.05)
Title I school	-0.11	(0.05)
<i>Teacher's highest degree earned^c</i>		
Master's degree	0.05	(0.03)
More-advanced degree	-0.06	(0.16)
Teacher has special education endorsement	-0.02	(0.03)
Teacher teaches core subject	0.23***	(0.03)
<i>Years of experience in education^d</i>		
5 years or less	0.33***	(0.04)
6–12 years	0.24**	(0.04)
13–21 years	0.06	(0.04)

** Significant at $p < .01$; *** Significant at $p < .001$.

Note: $n = 3,013$ teachers in 351 schools. Numbers in parentheses are standard errors. Coefficients are from a two-level multiple regression model that accounted for the nesting of teachers within schools. In this model, master's degree, more-advanced degree, teacher has special education endorsement, teacher teaches core subject, 5 years or less of experience in education, 6–12 years of experience in education, and 13–21 years of experience in education were all centered around the school mean. *Good, great, excellent*, middle school, high school, and Title I school were all centered around the mean for the whole sample.

a. *Needs improvement* was treated as the reference group for school accountability classification.

b. Elementary school was treated as the reference group for school level.

c. Bachelor's degree or lower was treated as the reference group for teacher's highest degree earned.

d. 22 years or more was treated as the reference group for years of experience in education.

Source: Authors' analysis of 2019 survey and administrative data from the Teacher Data Use Survey and the Nebraska Department of Education.