

# **Remote Learning Study**

DECEMBER 2022

Center for Connecticut Education Research Collaboration

# **CCERC Remote Learning Study: Appendices**

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# **Appendix A: Measures**

# **Connecticut State Department of Education (CSDE) administrative data**

Variable Name	Description
SASID	State Assigned Student ID
RaceEth	USDE race/ethnicity code:
	1. Hispanic/Latino of any race;
	2. American Indian or Alaska Native;
	3. Black or African American;
	4. Asian;
	5. Native Hawaiian or Other Pacific Islander;
	6. White; and
	7. Two or more races.
FRPL	3-category code for Free or Reduced-Price Lunch eligibility:
	F=eligible for free lunch;
	R=eligible for reduced-price lunch;
	N=ineligible
SpEd	Special Education status:
	Y=student has an active IEP and receives special education instruction
	(i.e., student with disability)
	N=student does not have an IEP (i.e. student without disability)
EL	English Learner status:
	Y=identified as an English Learner;
	N= not identified as an English Learner

Table A1. CSDE student demographic variables

Note: Students are included in the CSDE's high needs group if they are a student with a disability, English learner, or eligible for free or reduced-price lunch..

Variable Name	Description
SASID	State Assigned Student ID
FallOfYear	Year in which school year began
CollectionInstanceName	Name of data collection
GradeLevelCode	Code for student grade level, from PK-12
School_SK	School name
SchoolCode	School code
RptngDistrict_SK	Reporting district name
ReportingDistrictCode	Reporting district code
Fac1AttendanceDays	Number of attendance days at end-of-year school
Fac1MembershipDays	Number of days enrolled at end-of-year school
AttendanceRate	Attendance days divided by membership days, expressed as a
Changin Alegenterione	
ChronicAdsenteeism	1 II attendance rate is $\leq 90\%$ , 0 II attendance rate is $\geq 90\%$

 Table A2. CSDE enrollment and attendance variables

Variable Name	Description
SASID	State Assigned Student ID
FallOfYear	2014-2020
Grade	3-8, 11
AssessmentName	Smarter Balanced or SAT
Subject	ELA or Math
PerformanceLevel	1-4
ProficientOrAbove	1 if PerformanceLevel=3 or 4, 0 if PerformanceLevel=1 or 2
ScaleScore	Raw scale score

 Table A3. CSDE standardized assessment variables

Table A4. CSDE learning modes survey variable	Table .	A4. CSI	DE learning	g modes	survev	variable
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Variable Name	Description
District code	State assigned district identification number
District name	Name of district
School start date	Date of first date of school
Grades: In person	Comma delimited list of grades taught in person
Grades: Hybrid	Comma delimited list of grades taught hybrid
Grades: Remote	Comma delimited list of grades taught remote
ProficientOrAbove	1 if PerformanceLevel=3 or 4, 0 if PerformanceLevel=1 or 2
ScaleScore	Raw scale score
Percentage fully remote	Percentage from 0 to 100 of students attending fully remote in district
Total number students	Total number of students in district
Predominant model	Text variable describing the primary learning model across grades
Organization type	The type of Local Education Authority reporting
Alliance district	Whether alliance, alliance opportunity, or non-alliance district
Reporting period	Calendar week for which the remote learning report was made

Domain	Items
District information	Q1-Q3
Pre-pandemic learning opportunities	Q4
Spring 2020 learning models	Q5-8
Spring 2020 learning goals	Q5-8
Spring 2020 staffing	Q9
Spring 2020 professional development	Q10
Spring 2020 food security	Q11
Spring 2020 social services referrals	Q12-Q14
Summer 2020 preparation	Q15
2020-21 learning models	Q16
Fall 2020 staffing	Q17
2020-21 professional development	Q18
2020-21 food security	Q19
2020-21 social services referrals	Q20-Q22
2020-21 technology	Q23-Q25
Post-COVID plans	Q26
Spring 2020 student disengagement	Q27-Q28
2020-21 remote learning	Q29-Q33
2020-21 hybrid learning	Q34-Q35
2020-21 improvements in online learning	Q36
Changes in technology	Q37-Q41
Changes in assessment and grading	Q43-44
Changes in emotional wellbeing	Q45-Q47

Table A5. CCERC remote learning district inventory domains

Note: The complete CCERC remote learning district inventory is posted at <u>https://osf.io/9k5yg</u>.

# **CCERC** remote learning teacher survey

Table Ao. CCERC remote rearining teacher survey domains				
Domain	Items			
Professional background	Q1-Q5			
2019-20 Instructional models	Q6-Q8			
2020-21 Instructional models	Q9-Q17			
2020-21 Teaching challenges	Q18			
Technology	Q19-Q21			
Professional development	Q22-Q23			
Priorities, needs, and supports	Q24-Q28			
Teacher beliefs and preferences about learning models	Q29-Q31			
Teacher demographics	Q32-Q35			

# Table A6. CCERC remote learning teacher survey domains

*Note: The complete CCERC remote learning district inventory is posted at <u>https://osf.io/psrgf</u>.* 

## Table A7. Teacher survey respondents by district type

Based on district named in Teacher Survey Q4. In what school district were you a teacher?

	Survey respondents		Connecticut teachers	
	Valid	Valid	$\mathbf{ETE}_{\mathbf{c}}$	Doroont
	Count	Percent	FIES	reicent
Alliance Districts (including Opportunity	1000	25 4	16717.0	20.0
Districts)	1009	55.4	10/1/.9	39.9
Local School Districts (excluding Alliance	1474	40.0	10720 5	471
Districts)	1424	49.9	19/30.3	4/.1
Regional School Districts	150	5.3	1975.6	4.7
Public Charter School Districts	45	1.6	758.6	1.8
Endowed and Incorporated Academy Districts	45	1.6	267.6	0.6
Regional Education Service Center Districts	108	3.8	1338.7	3.2
College Affiliated School Districts	2	0.1	0.0	0.0
State Agencies	4	0.1	122.5	0.3
CT Technical Education and Career Districts	64	2.2	982.7	2.3
Total N	2851	100.0	41894.1	100.0

# Table A8. Teacher survey respondents by education level

Teacher Survey Q2. What grade levels did you teach? Please select all that apply.

· · · · ·	1	1 2
	Survey re	spondents
	Valid Count	Valid Percent
Elementary school	1024	35.9
Middle school	576	20.2
High school	899	31.5
Multiple levels, ungraded, or unknown	352	12.3
Total N	2851	100.0

*Note: CSDE does not report teachers by grade level. Also note that respondents were instructed to "select all that apply;" the fourth category includes respondents who selected* >1 *education levels.* 

# Table A9. Teacher survey respondents by job type

	Survey respondents		Connecticut teachers		
	Valid	Valid	FTE	Doroont	
	Count	Percent	FIES	Fercent	
Special education	345	12.1	6976.17	16.4	
General education			35663.2	83.6	
Early childhood or general elementary	690	24.2			
Arts or music	196	6.9			
English and language arts	326	11.4			
English as a second language or bilingual	113	4.0			
education					
Foreign languages	130	4.6			
Health education	27	0.9			
Mathematics	288	10.1			
Natural sciences	243	8.5			
Social sciences	197	6.9			
Career or technical education	110	3.9			
Other (please describe)	184	6.5			
Total N	2849	100.0	42639.4	100.0	

*Teacher Survey Q3. What was your main teaching assignment?* 

Note: CSDE reports teachers by general education vs. special education; CSDE does not report general education teachers by certification area or teaching assignment.

## Table A10. Teacher survey respondents by years of experience

*Teacher Survey Q32. Including this school year (2021–2022), but excluding your student teaching, how long have you worked as a teacher? Please round to the nearest whole number.* 

	Survey re	espondents	Connecticut teachers		
	Valid	Valid	FTE	Doroont	
	Count Percent		F1E8	reicem	
1-5 years	223	8.7	8674.21	20.3	
6-15 years	829	32.5	15038.39	35.3	
16 or more years	1498	58.7	18926.75	44.4	
Total N	2550	100.0	42639.35	100.0	

12		0		
	Survey re	Survey respondents		<i>ut teachers</i>
	Valid	Valid	ETE~	Doncont
	Count	Percent	<b>FIES</b>	Percent
Male	442	16.9	10362.90	24.3
Female	2095	79.9	32276.45	75.7
Another gender identity	12	0.5		
Prefer not to answer	72	2.7		
Total	2621	100.0	42639.35	100.0

**Table A11. Teacher survey respondents by gender**Teacher Survey Q33. How would you describe your gender?

Note: Note that the CCERC RL teacher survey offered response options for the gender question that differ from how CSDE collects data on teacher gender.

# **Table A12. Teacher survey respondents by age***Teacher Survey Q34. What is your age?*

	Survey respondents		Connecticut teachers	
	Valid	Valid	ETE	Donoont
	Count	Percent	FIES	Percent
20-29	155	5.9	4893.95	11.5
30-39	545	20.8	11175.54	26.2
40-49	710	27.1	12179.66	28.6
50-59	794	30.3	10163.17	23.8
60 or older	339	12.9	4227.03	9.9
Prefer not to answer	78	3.0		
Total	2635	100.0	42639.35	100.0

	Survey respondents		Connecticut teachers	
	Valid Count	Valid Percent	FTEs	Percent
American Indian or Alaska Native	15	0.6	58.14	0.1
Asian	39	1.5	576.43	1.4
Black or African-American	75	2.8	1527.05	3.6
Hispanic, Latino, or Spanish origin	128	4.9	1905.5	4.5
Middle Eastern or North African	10	0.4		
Native Hawaiian or other Pacific Islander	2	0.1	22.2	0.1
White	2266	86.4	38409.81	90.2
Two or more races			80.42	0.2
Some other race, ethnicity, or origin	22	0.8		
Prefer not to answer	159	6.1		
Not reported			59.8	0.1
Total			42579.55	100.0

### Table A13. Teacher survey respondents by race/ethnicity

Teacher Survey Q35. What categories describe you? Please select all that apply.

Note: Note that the CCERC RL teacher survey offered response options for the race/ethnicity question that differ from how CSDE collects data on teacher race and ethnicity. In addition, the CCERC RL teacher asks respondents to select all that apply, whereas the CSDE demographic categories include "Hispanic or Latino of any race" and "Two or more races." For this reason, the teacher survey columns include more than one response for some respondents and valid percentages do not add up to 100%.

# **CCERC** remote learning focus groups

# Table A14. CCERC remote learning teacher focus group protocol

This first set of questions will focus on your <u>experiences in March of 2020</u> at the beginning of the pandemic and also during the <u>2020-2021 school year</u>.

- 1. Thinking back to the beginning of the pandemic in the Spring of 2020, what was your greatest teaching challenge?
  - a. What about during the <u>2020-2021 school year</u>, what would you say was your greatest teaching challenge then?
- 2. What about your students? What were their greatest needs in the Spring of 2020?
  - a. What about during the <u>2020-2021 school year</u>, what do you think were your students' greatest needs then?
- 3. How did you connect with your students in the Spring of 2020 when the pandemic first began?

b. What strategies <u>worked well to help you connect with your students</u> when you first pivoted to remote or asynchronous teaching?

- 4. What about during the 2020-21 school year, how did you connect with your students?
  - a. What strategies <u>worked well to help you connect with your students</u> during the 2020-21 school year?

# Now I would like to ask you about any <u>training or supports</u> that were offered in the Spring of 2020 and in the 2020-21 school year, to assist with changes in teaching modalities.

- 5. In the spring of 2020 what supports or resources such as: technology supports, curriculum resources, resources to help support your students or other resources did your district provide as you transitioned to fully remote or asynchronous teaching?
  - a. How <u>helpful</u> were these supports?
  - b. What else was needed?
- 6. How did the 2020-2021 school year begin in your district, in person, remote or hybrid?
  - a. Were there any <u>changes in teaching modality</u> as the year progressed?
  - b. What <u>supports or resources</u> such as technology supports, curriculum resources, resources to help support your students or other resources were provided as you continued to teach remotely or in person?
  - **c.** How <u>helpful</u> were these supports?
  - d. What else was needed?

7. When you think back to how parents navigated the different learning models and transitions from one learning model to another, what types of supports if any did parents need you to provide to help them navigate these learning models?

The next set of questions have to do with how students were doing and access to services and supports since the beginning of the pandemic.

- 8. When you think about <u>student learning (and achievement)</u> in the 2020-21 school year, how did that compare to prior to the pandemic?
- 9. What about any <u>emotional concerns</u> of your students like stress, anxiety, depression, trauma in the 2020-21 school year, how did this compare to prior to the pandemic?
- 10. What about <u>student behavior</u> during the 2020-21 school year, how did that compare to prior to the pandemic?
- 11. What resources or skills did you have to address student concerns?
  - a. What other resources would have been helpful to support your students?
  - b. Were <u>support services like social work</u>, <u>guidance counselors available</u> to students and families during the 2020-2021 school year?
    - i. What did families do if they needed more support?

# 12. What <u>about you and your colleagues</u>, what supports were provided to you to support <u>your physical and emotional well-being</u>?

# We just have two more questions.

- 13. Looking back on these past two years, is there anything <u>that you learned or any</u> <u>changes that were made during the pandemic</u> that you think should continue postpandemic?
- 14. Finally, what is the <u>take home message for the state</u> in thinking about how to prepare for something like this in the future?

Thank you for participating in this focus group, the information you shared will be invaluable in helping the state to understand the experiences of teachers during the pandemic.

<u>·</u> • •	Focus grou	p participants	Connecticut teachers	
	(n	=67)	(n=42,639.35)	
	n	%	%	
Age				
20-29	3	5%	11%	
30-39	21	31%	26%	
40-49	16	24%	29%	
50-59	21	31%	24%	
60-69	6	9%	7%	
Gender				
Male	14	20.9%	24%	
Female	53	79.1%	76%	
Race/Ethnicity (select all)				
Asian	1	2%	1%	
Black or African American	7	10%	4%	
Hispanic, Latino, or Spanish origin	5	8%	5%	
White	57	85%	90%	
Other	0	-	<1%	

# Table A15. Teacher focus group participants' demographics

# Table A16. Teacher focus group participants' professional characteristics

Years of teaching experience	Focus group	o participants	<b>Connecticut teachers</b>
(excluding student teaching)	(n=	=67)	(n=42,639.35)
Mean	-	17	
SD	8	.73	
Min / Max	2 .	/ 36	
Current Role (select all that apply)	n	%	%
General Education Teacher	50	75%	84%
Special Education Teacher	10	15%	16%
Other Teacher (e.g., ESL teachers, specialists)	11	16%	
Other (e.g., instructional coach, afterschool teacher, etc.)	7	10%	
Type of School District			
Alliance	57	70%	60%
Non-Alliance	20	30%	40%
District locale			
Urban	30	44.8%	
Suburban	29	43.3%	
Rural	8	11.9%	
School Type (select all)			
Elementary School (grades preK-5)	24	35.8%	
Middle School (grades 6-8, 5-8, etc.)	22	32.8%	
High School (Grades 9-12)	25	37.3%	

### **Appendix B: Technical details**

## Administrative data analysis

We first estimate a model of the likelihood that a school (s) belongs to an LEA or district (d) that provides an in person option either hybrid or fully in person in September (I) as a function of both the school share of high needs students  $(Z_{sd})$  and the type of LEA  $(T_d)$ . All models are weighted by pre-pandemic school enrollment. We estimate simple probit models of this likelihood that follows the standard form.

$$I_{sd} = \begin{cases} 1 & if \ I_{sd}^* > 0\\ 0 & otherwise \end{cases}$$
(1)  
where

$$I_{sd}^* = \alpha_1 + \alpha_2 Z_{sd} + \alpha_3 T_d + \alpha_4 T_d Z_{sd} + \varepsilon_{sd}$$
<sup>(2)</sup>

We also estimate similar models for a two sided Tobit on share of days offered in person (S) since this share is truncated at zero and one. ; f C\* > 1 11

$$S_{sd} = \begin{cases} 1 & \text{if } S_{isd} \ge 1 \\ S_{sd}^* & \text{if } 1 > S_{isd}^* > 0 \\ 0 & \text{if } S_{isd}^* \le 0 \end{cases}$$
(3)  
where  
$$S_{sd}^* = \varphi_1 + \varphi_2 Z_{sd} + \varphi_3 T_d + \varphi_4 T_d Z_{sd} + \varepsilon_{sd}$$
(4)

With the notable change that LEA type is specified as a vector of indicators because the continuous share of days variables allows for a more disaggregate classification of LEA's. Standard errors in both models are clustered at the district level.

For examining student take up, we regress each student's fraction of days enrolled in person relative to the total days enrolled each month  $(F_{isdt})$  on our calculated share of days available in person each month based on weekly learning modes relative to the total days of school each month  $(S_{sdt})$ . 5)

$$F_{isdt} = \alpha + \beta S_{dt} + \varepsilon_{isdt} \tag{5}$$

We also estimate an interactive model based on each school's share of high needs students

$$F_{isdt} = \alpha + \beta_1 S_{dt} + \beta_2 Z_{sdt} + \beta_3 S_{dt} Z_{sdt} + \varepsilon_{isdt}$$
(6)

Standard errors are clustered at the district level.

For examining initial enrollment of kindergarteners, we only observe students who actually enrolled in kindergarten, and so we cannot know how many students would have enrolled if the pandemic had not occurred. Therefore, we reverse the regression, similar to many studies of discrimination in police stops where those at risk of stop are unobserved (Kalinowski et al. 2021; Grogger and Ridgeway 2006), and regress whether the school belongs to an LEA that provided a September in person option (I) on a linear trend (T) and a dummy for the pandemic year (P) using a linear probability model.

$$I_{isdt} = \alpha + \beta T_t + \gamma P_t + \varepsilon_{isdt} \tag{7}$$

The trend allows enrollment to change over time away from or towards schools that will offer an in person option in 2020-21, and the pandemic dummy tests for a trend break associated with enrollment responses to an in person option. Again, we expand this model allowing effects to differ between schools with high and low shares of high needs students.

$$I_{idt} = \alpha_1 + \beta_1 T_t + \gamma_1 P_t + \alpha_2 Z_d + \gamma_2 P_t Z_d + \varepsilon_{idt}$$
Again, standard errors are clustered at the district level. (8)

While we observe large declines in kindergarten enrollment, a significant share of that decline is eliminated by the end of the school year because students enroll in kindergarten midway through the school year. Using first grade enrollments, we estimate a month by month model of the likelihood of observing 2021-22 first graders enrolled in kindergarten (E) during the 2020-21 school year in order to test whether in person opportunities (share days in person) increases the likelihood of mid-year enrollment among those future first graders who have not yet enrolled.

$$\begin{split} E_{isdt} &= \alpha + \beta S_{dt} + \varepsilon_{isdt} & (9) \\ E_{isdt} &= \alpha + \beta_1 S_{dt} + \beta_2 Z_{sdt} + \beta_3 S_{dt} Z_{sdt} + \varepsilon_{isdt} & (10) \\ \text{We mean difference share in person prior to including the control so that intercept can be interpreted as the share of first graders present in kindergarten for the state average share of days offered in person. \end{split}$$

Next, we exploit longitudinal information on students starting with enrollment in fall 2020-21 (*E*) if the student was observed in public education in the previous year. Continued enrollment is estimated using a difference-in-differences model, comparing changes in the likelihood of continuing enrollment the next year pre/post pandemic and estimating differences in those differences between schools with an in person option in September and those without.

$$E_{isdt} = \alpha_{sd} + \gamma_1 P_t + \gamma_2 P_t I_d + \varepsilon_{isdt} \quad for \quad E_{isdt-1} = 1$$

$$E_{isdt} = \alpha_{sd} + \gamma_1 P_t + \gamma_2 P_t I_d + \gamma_3 P_t Z_{sd} + \gamma_4 P_t I_d Z_{sd} + \varepsilon_{isdt} \quad for \quad E_{isdt-1} = 1$$
(11)
(12)

where  $\alpha_{sd}$  are school fixed effects.

Estimates of equations (2) and (4) will show that high needs districts are less likely to provide in person learning and traditional public schools are more likely to provide in person learning than choice schools like magnet or charter schools. Therefore, we use the propensity score estimates from equation (2) to develop overlap weights (Li et al. 2018), and re-estimate equations (11) and (12) using weighted regressions. Overlap weights, like inverse propensity score weights, restore sample balance, but do so by targeting the product of the probability of treatment and the probability of not receiving treatment, which places more weight on propensity scores near zero where the data provides equal support over treatment and non-treatment. Specifically, we define overlap weights as

$$W_{isd} = \begin{cases} \left(1 - F(\hat{\alpha}_1 + \hat{\alpha}_2 Z_{sd} + \hat{\alpha}_3 T_d + \hat{\alpha}_4 T_d Z_{sd})\right) & \text{if } NR_{isd}^* = 1\\ F(\hat{\alpha}_1 + \hat{\alpha}_2 Z_{sd} + \hat{\alpha}_3 T_d + \hat{\alpha}_4 T_d Z_{sd}) & \text{if } NR_{isd}^* = 0 \end{cases}$$
(13)

based on estimates arising from equation (2).

Finally, we develop difference-in-differences models of attendance and test scores (Y) that include controls for lagged student outcomes. For these models, we control for the share of days offered in person over the relevant portion of the school year.

$$Y_{isdt} = \alpha_{sd} + \delta Y_{idt-s} + \gamma_1 P_t + \gamma_2 P_t S_{sd} + \varepsilon_{isdt}$$
(14)  

$$Y_{isdt} = \alpha_{sd} + \delta Y_{idt-s} + \gamma_1 P_t + \gamma_2 P_t S_{sd} + \gamma_3 P_t Z_{sd} + \gamma_4 P_t S_d Z_{sd} + \varepsilon_{isdt}$$
(15)

where *s* represents the lag applied to the previous outcome control, which is one year for attendance in our primary models and two years for test scores.

As with September in person learning, we use the estimates from equation (4) to obtain a propensity score associated with each student's school's tendency to offer a higher share of days in person based on the school's share of high need students and LEA. However, simple weighting approaches based on probabilities or densities are not available because the appropriate model for share of days involves a continuous variable with truncation. Since the weights are intended to avoid differences in trends created by imbalance in the sample over treatment, we instead address potential bias from such trends by adding an interaction of the propensity score with the pandemic control. The propensity score is defined as

$$\hat{S}_{sd} = \hat{\varphi}_1 + \hat{\varphi}_2 Z_{sd} + \hat{\varphi}_3 T_d + \hat{\varphi}_4 T_d Z_{sd}$$
(16)

Admittedly, the same effect could be accomplished by adding the controls in equation (16) interacted with the pandemic variable to equations (14) and (15). However, by using the propensity score, we can mean difference a single variable, propensity score, prior to inclusion in the model, and as a result the pandemic variable estimate represents the effect for the average school in terms of propensity to offer a high share of days in person. The resulting model is

$$Y_{isdt} = \alpha_{sd} + \delta Y_{idt-s} + \gamma_1 P_t + \gamma_2 P_t S_{sd} + \gamma_3 P_t \left(\hat{S}_{sd} - \bar{S}\right) + \varepsilon_{isdt}$$

$$Y_{isdt} = \alpha_{sd} + \delta Y_{idt-s} + \gamma_1 P_t + \gamma_2 P_t S_{sd} + \gamma_3 P_t Z_{sd} + \gamma_4 P_t S_d Z_{sd}$$

$$(17)$$

$$+\gamma_5 P_t \left(\hat{S}_{sd} - \bar{S}\right) + \varepsilon_{isdt}$$
(18)

Standard errors for all difference-in-differences models are clustered at the level of the fixed effects, i.e. the school.

For all difference-in-differences models, we estimate falsification tests where we treat an earlier year, 2018-19, as a fake pandemic year and use the years 2016-17 and earlier as the pre-event sample.

# **District inventory indicators of remote learning conditions**

Domain	Item	Levels*	Response Set/Measurement
1. Synchronous learning in spring 2020	As of May 1 2020, what did learning look like when students from the following grade levels were learning from home?	Е, М, Н	<ul> <li>Binary indicator (fully or partially synchronous vs. fully asynchronous) based on four possible responses:</li> <li>a. Fully asynchronous without technology: assignments were distributed in print format and no online/electronic learning materials were provided</li> <li>b. Fully asynchronous with technology: students had no classes conducted in real time through video conferencing (for example, Google Meet or Zoom), but online/electronic learning materials were provided (e.g, online activities, instructional videos, etc.)</li> <li>c. Partially synchronous: students had at least one class meeting conducted in real time through video conferencing (for example, Google Meet or Zoom)</li> <li>d. Fully synchronous: the majority of students' classes took place in real time, through video conferencing (for example, Google Meet or Zoom)</li> </ul>
2. Student technology access in spring 2020	<ul> <li>(1) Please provide your best guess for what percentage of students had sufficient internet access for full participation in online learning as of the following dates. March 1, 2020</li> <li>(2) Please estimate the percentage of [GRADE SPAN LEVEL] students who had access to digital devices at home as of March 1, 2020: - Chromebooks, laptops, or iPads provided by the district or by family</li> </ul>	Е, М, Н	Mean percentage based on the two items.

# Table B1. District inventory indicators: Remote learning conditions in spring 2020

Note: \*E,M,H=Question asked regarding elementary, middle, and high school levels; District=Asked of the district as a whole

Domain	Item	Levels	Response Set/Measurement
3. Summer 2020 preparation for fall	Which of the following activities did your district conduct between the last student day of spring 2020 and the students' return to school in fall 2020? Please select all that apply.	District	<ul> <li>Count of the following binary responses:</li> <li>a. Building improvements (ventilation, air purification devices, directional signs)</li> <li>b. Purchase of safety equipment (PPE; e.g. shields, masks)</li> <li>c. Creating online resources for teachers</li> <li>d. Adopting new learning management platforms</li> <li>e. Hiring additional personnel (e.g. tutors, counselors, etc.)</li> <li>f. COVID safety training for school personnel</li> <li>g. Paid professional development related to learning technology</li> <li>h. Paid professional development related to strategies for remote teaching</li> <li>i. Voluntary workshops related to strategies for remote teaching</li> </ul>
4. Improvements for remote learning in 2020- 21	In what ways did remote learning for [ <b>GRADE SPAN</b> <b>LEVEL</b> ] students improve from 2019-20 to 2020-21? [Respondents select all that apply]	E,M,H	<ul> <li>Count of the following binary responses:</li> <li>a. Better learning management system</li> <li>b. Better apps in place</li> <li>c. Improved accessibility for students</li> <li>d. Teacher fluency with remote learning tech</li> <li>e. Teachers' integration of recommended apps/tools</li> <li>f. Improved tech support for teachers</li> <li>g. Increased implementation of on-grade curriculum</li> </ul>
5. Rigor of student assessment in 2020-21	On what basis did your [GRADE SPAN LEVEL] teachers report student progress during each of the following time periods? <i>Please select <u>all that apply</u></i> <i>for school year 2020-21.</i>	E,M,H	<ul> <li>Weighted sum of two items:</li> <li>0-2 points based on grading approach (maximum score wins):</li> <li>0. "Grading was suspended" and/or "Pass/fail" was selected AND neither "Proficiency" and/or "Letter grades" was selected</li> <li>1. "Proficiency" and/or "Letter grades" was selected AND "Grading was suspended" and/or "Pass/fail" was selected</li> <li>2. "Proficiency" and/or "Letter grades" was selected AND neither "Grading was suspended" or "Pass/fail" was selected</li> </ul>

# Table B2. District inventory indicators: Remote learning conditions in 2020-21

What data did your district 1 point each for in-class assignments, quizzes/tests, diagnostic use to assess how [GRADE assessments: **SPAN LEVEL**] students a. Their completed classroom tasks or assignments were doing during the Their performance on classroom quizzes or tests b. following time periods? c. Diagnostic or benchmark schoolwide assessments in English language *Please select all that apply* arts for school year 2020-21. d. Diagnostic or benchmark schoolwide assessments in mathematics No points for: Their attendance in class Their responses to a student survey (excluding social and emotional ٠ assessments) Their performance on a social and emotional assessment ٠ 6. Social services During the 2020-21 school District Mean score of two items: referrals in year, how did your district's allocation of resources for 2020-21 referrals to social services 5-point scale: Allocated a lot more resources to Allocated a lot less (for example, physical or resources behavioral health care, nutrition assistance, housing assistance) compare to spring 2020? During the 2020-21 school year, how did the number of students referred for social services (for example, 5-point scale: A lot more students to A lot fewer students physical or behavioral health care, nutrition assistance, housing assistance) compare to spring 2020?

Note: E,M,H=Question asked regarding elementary, middle, and high school levels; District=Asked of the district as a whole

# Analysis of integrated data set

# Approach for Inferential Analyses (see Figure B1)

- 1. Estimate treatment effects with difference-in-differences models for each combination of district-level predictors and the four outcomes of interests (24 models) across all relevant grades for standardized assessment performance and broader grade spans for attendance.
- 2. Using pooled samples across all relevant grades or grade spans, we will conduct an F-test for each of the four outcomes listed above to assess whether the district-level treatments predict any of these outcomes for any grade or grade span.
- 3. We will then combine the information from these four tests to assess the *general* combined statistical significance of any rejection of the null hypothesis above.
- 4. We will test for the *specific* combined effect of each treatment using a Bonferroni stepdown procedure to adjust for Type-1 error.

# Approach for Exploratory Analyses (see Figure B2)

- 5. If the specific combined effect for a treatment is significant with alpha set to .10, we will explore the treatment's effect on each outcome at the .05 level.
- 6. If the above step is significant for any of the outcomes, we will examine the treatment effect at each grade span (k-2, 3-5, 6-8, and 9-12) for each significant outcome, again setting alpha at .05.
- 7. If any grade span is significant, we will assess whether effects differ across demographic groups by assessing homogeneity via F-tests.



## Figure B1: Inferential analysis

## Figure B2: Exploratory analysis



# Detailed Description of Inferential Analysis (see Figure B1)

# Estimation of Treatment Effect Models

Students in our administrative data will be matched to district inventory data based on the district and the type of school (i.e., elementary, middle or high school) they attended as of October in a given academic year. We will use the administrative data to determine the grades for each school type within each district. We will classify schools with kindergarten or first grade as elementary school and schools with 11<sup>th</sup> and 12<sup>th</sup> grade as high school by default. For districts with uniform grade structure across all schools, we will then assign additional grades (e.g., 2<sup>nd</sup>, 3<sup>rd</sup>, etc.) to elementary school based on the grades contained in the schools that educate kindergarten and/or first grade students. Similarly, for high school, we will assign additional grades (e.g., 9<sup>th</sup>, 10<sup>th</sup>) to high school that are contained in the schools that educate 11<sup>th</sup> and 12<sup>th</sup> grade students. If only one additional type of school exists in a district in terms of grades served, that school will be assigned as a middle school. When different schools within the same district serve different combinations of grades (e.g., a large district with some K-8 schools and some K-5 schools), then we will rely on our district inventory to determine which schools or grades within schools the district classifies as elementary, middle, or high school. In cases where the district inventory is ambiguous, we will contact the districts directly for clarification. Students attending approved special education schools will be excluded from the analysis sample because these schools are very small, highly specialized, and implemented substantively different learning models during the pandemic, compared to traditional schools.

We will then construct longitudinal student samples for the school years of 2017-18 through 2020-21, pooling the cross-sections of students across these years. The use of longitudinal data allows us to control for lagged outcomes minimizing concerns of bias from selective attrition from the sample during the 2020-21 school year. For attendance, we restrict this sample to observing each student in the spring enrollment file for the previous year and in both the fall and spring enrollment files for the current year. If students change school during the year, we base treatment on their fall enrollment file school. These restrictions assure that we observe attendance rates for both the current year and the previous year and that students are exposed for the entire 2020-21 year to the calculated treatment of share of days offered in person. For

standardized assessment scores, we create subsamples of the two-year lagged attendance rate sample for ELA and Math assessment scores where students are only included in this sample if we observe an ELA or Math assessment score in both the 2020-21 year and two years earlier. The two-year restriction is imposed because these assessments were not administered in 2019-20, and this restriction implies that our ELA and Math assessment score samples are restricted to 5th, 6th, 7th and 8th grades.

Using the pooled samples, we will estimate separate models for each treatment-outcome pairing so that we can develop separate general p-values (prior to correcting for Type-1 error) that allow for different effects for different measures of student outcomes. This yields24 difference-indifferences models: one for each combination of 6 treatments and 4 outcomes. Models will consist of student *i*'s attendance rate, chronic absenteeism status (0/1), assessment scale scores and assessment proficiency during grade g in school s and district  $d(Y_{igsdt})$  that include controls for a pandemic year dummy  $(P_t)$  where t represents the academic year, the interaction of pandemic year with district d treatment  $(T_{sd})$ , the lagged student outcome and school s fixed effects. We will estimate different models for each grade or grade span by interacting all controls including the fixed effects with the grade or grade span. For performance outcomes (assessment scores and proficiency), models will be estimated separately by each grade. For attendance outcomes (attendance rate and chronic absenteeism status), models will be estimated separately by grade span (elementary, middle and high school), except that we will also allow for separate models for early elementary grades (kindergarten, 1<sup>st</sup> and 2<sup>nd</sup> grades) and later elementary school grades. For these analyses, students will be grouped into grade spans based on the school at which they are enrolled. As an example, 6<sup>th</sup> grade students attending a middle school will be included in the middle school model, while 6<sup>th</sup> grade students attending an elementary school will be included in the later elementary school model. For the two binary indicators, chronic absenteeism and assessment proficiency, we will estimate linear probability models to facilitate the use of high dimensional fixed effects.

$$Y_{igsdt} = \alpha_{gsd} + \gamma_{0g} Y_{igsdt-s} + \gamma_{1g} P_t + \gamma_{2g} P_t T_{sd} + \varepsilon_{igsdt}$$

where *s* represents the lag applied to the previous outcome control, which is one year for attendance outcomes and two years for performance outcomes. Standard errors will be clustered in two ways: at the school level and at the student level. School fixed effects yield estimates based on within school comparisons, and clustered robust standard errors are robust to general correlation and heteroscedasticity within clusters.

For all treatments except Improvements in Remote Learning 2020-21, we will use an F-test to assess the null hypothesis of whether  $\gamma_{2g} = 0$  for all g.

In the case of the Improvements in Remote Learning 2020-21 treatment, these improvements are unlikely to matter if virtually all education within a school took place in person. Therefore, we will estimate an alternative model interacting the pandemic year dummy and treatment with a measure of the share of days during the school year where learning was required to be remote  $(S_{sd})$  at the student's school.

$$Y_{igsdt} = \alpha_{gsd} + \gamma_{0g}Y_{idt-s} + \gamma_{1g}P_t + \gamma_{2g}P_tT_{sd} + \gamma_{3g}P_tS_{sd} + \gamma_{4g}P_tT_{sd}S_{sd} + \varepsilon_{igsdt}$$

We will then use an F-test to the null hypothesis of whether  $\gamma_{4g} = 0$  for all g.

## Testing the Null Hypothesis Separately for Each Treatment

Rather than using resampling approaches, we will stack the data pooling grades or grade spans and use interaction terms to allow for a separate model for each outcome. In the case of attendance data, we will combine the data for all students in each grade K-12. For assessment data, we will standardize all scores by assessment (Smarter Balance or SAT and ELA or math) by grade by year. Similar stacks will be created using binary outcomes associated with SBAC and SAT assessment proficiency (based on state established proficiency thresholds for scores) and chronic absenteeism (based on the state definition of missing 10% or more of enrolled days).

Then, separately for (1) attendance, (2) chronic absenteeism, (3) standardized assessment scores and (4) standardized assessment proficiency, we will estimate pooled sample models except that the school fixed effects will now be by school by grade (or grade span) and we will include interaction terms between our treatment variable (the treatment indicator interacted with the pandemic dummy) and each grade (or grade span) dummy, omitting the treatment variable itself so that all grade (or grade span) interaction estimates are relative to pre-pandemic levels. We will then use an F-test to test the null hypothesis above separately for the four regressions. These Ftests independently test four separate null hypotheses  $H_a^1$  that the treatment considered has no positive influence on any of the grades (or grade spans) examined.

Unlike controls for the Family-Wise Error Rate (FWER), such as Bonferroni adjustments, we cannot ignore the correlation between tests. When combining results under a test for whether at least one null is rejected, correlation between those tests will reduce the certainty provided by multiple rejections of null hypotheses and yield a test that is too likely to reject the null. Too correct for correlations between tests without resampling, Conneely and Boehnke (2007) recommend assuming that the estimates are distributed as a multi-dimensional normal distribution and directly calculating the likelihood of a type 1 error using the estimated parameters and the correlation matrix between those estimates.

To estimate the average correlation across the tests in our four regressions, we will estimate twoequation, seemingly unrelated, regression models for pairs of outcome variables. Separate models of treatment effects on outcomes will be estimated for each grade (or grade span) that is common between the related dependent variables, again controlling for fixed effects and a pandemic year dummy. We will back out a correlation coefficient between the estimated treatment effect estimates in the two equations for each grade (or grade span) for each pair of treatments, and then for each pair we calculate a population weighted average of each set of estimated correlations averaged across the grades (or grade spans).

Under the null for each outcome, the p-values  $(\hat{P}_k)$  resulting from that F-test describe the Cumulative Distribution Function (CDF) of the distribution of F-tests over potential populations. Therefore, we can map these probabilities into a continuous latent variable  $(\hat{Z}_k)$  and if we use the

standard normal CDF to conduct that mapping then each variable will be distributed as standard normal under the null by construction. Specifically,

$$\hat{Z}_k = F^{-1}(\hat{P}_k)$$

where F is the CDF of the standard normal. Finally, we impose a very intuitive, but somewhat strong assumption, that the average correlations between the treatment effect estimates for each pair provide a good proxy for the correlation between the normally distributed latent variables. Then our calculation for the probability that none of the four null hypotheses are false (i.e., at least one alternative hypothesis is true) can be calculated as

$$Pr[H_a^1 \text{ or } H_a^2 \text{ or } H_a^3 \text{ or } H_a^4] = F[\hat{Z}_1, \hat{Z}_2, \hat{Z}_3, \hat{Z}_4 | \hat{\Sigma}]$$

where  $\hat{\Sigma}$  is the estimated correlation matrix between the treatment effect estimates.

# Type 1 Error Adjusted Tests for Whether a Treatment Matters

Turning to our six hypothesis tests regarding treatment effects on any outcome in any grade (or grade span), we wish to draw strong conclusions concerning which specific elements of district behavior or actions influenced student outcomes. Therefore, we must provide a correction for multiple hypothesis testing to control for the FWER. To do this, we will use the step-down Bonferroni correction as in Holm (1979). This approach orders the p-values from low to high, i.e.  $\hat{P}_1$  to  $\hat{P}_K$  where K is the number of tests and  $\hat{P}_{k-1} \leq \hat{P}_k$  for all k, and adjust the standard Bonferroni correction. This test takes the following form for a corrected P-value

Holm-Sidak:  $\tilde{P}_k = (K + 1 - k)\hat{P}_k$  for all k where  $\tilde{P}_k \le \alpha$ 

# **Considering Resampling Approaches**

# Null Hypothesis Separately for Each Treatment

We will generate 10,000 bootstrap samples conducting the hypotheses tests for every sample and counting the share of samples in which the null is rejected (Westfall and Young, 1993, p. 123). Specifically, since the null is rejected if the treatment matters for any outcome considered, a false rejection of the null in the bootstrap sample is only recorded if the estimated p-values for each outcome in a bootstrap sample is less than the estimated p-value for every outcome using the original sample. Then, the corrected p-value is the share of bootstrap samples that falsely reject the null.

Due to the clustered nature of our data and the use of school fixed effects, we will use a clustered bootstrap resampling schools with replacement. We will use a cluster bootstrap in pairs approach sampling with replacement jointly the controls and the outcome (and so sampling the controls and residual in pairs) associated with an observation. As shown by Cameron, Gelbach and Miller (2008), sampling residuals for a fixed population of observations can have poor size properties (i.e., reject the null far too often) when the unobservable is heteroscedastic, while both clustered standard errors and the pairs cluster bootstrap have proper size under heteroscedasticity, as long as the number of clusters is not too small, over 30 observations.

The bootstrap procedure for our null hypothesis is as follows:

- 1. Estimate all outcome models separately by grade (or grade span) for a given treatment. For assessment scores, each grade (or grade span) and subject (i.e. ELA or Math) will result in a separate regression. In the case of attendance, we will divide the sample into the following grade spans for estimation: early elementary (K-2), late elementary, middle school and high school. Save the treatment effect estimates ( $\hat{\beta}_j$ ) and estimated standard errors ( $\hat{\sigma}_i$ ) where *j* is the index for each model where there are *J* models.
- 2. Create bootstrap samples by sampling schools with replacement retaining all observations associated with each selected school, while preserving the number of schools in each bootstrap sample.
- 3. For each bootstrap sample *i*, re-estimate all outcome regression models for each grade (or grade span) collecting the bootstrap sample treatment estimates  $(\hat{\gamma}_{ij})$  and standard errors  $(\hat{\omega}_{ij})$ .
- 4. Calculate the likelihood of a Type-1 error  $(\hat{q}_{ij})$  (i.e. the standard p-value for the bootstrap sample) when rejecting the null hypothesis  $\hat{\beta}_j = \hat{\gamma}_{ij}$  following the shift and pivot approach described by (Westfall and Young, 1993, p. 38).
- 5. For each bootstrap sample *i*, test whether  $\hat{p}_j$  is greater than or equal to  $\hat{q}_{ij}$  for all *j* and if so set  $\delta_i = 1$ , which is consistent with the rejection of all null hypotheses even though all null hypotheses are true. The generalized p-value is the fraction of bootstrap samples that satisfies this condition, i.e. the mean of  $\delta_i$  ( $\bar{\delta}$ ).

# Type 1 Error Adjusted Tests for Whether a Treatment Matters

By choosing a very large bootstrap sample for the individual treatment analyses and using the same bootstrap sample for each treatment, we can resample among the bootstrap samples to conduct our Type-1 Error adjustment for the Family-Wise Error Rate. For example, if we drew a sample of 10,000 bootstrap samples based on sampling schools with replacement and saved the estimation results across all treatments for all 10,000 samples, then it would be reasonable to repeatedly draw 1,000 of these samples with replacement to obtain adjusted p-values.

- 1. Draw bootstrap samples with replacement from the full set of bootstrap samples from the previous step above where we have conducted regression estimates and calculated adjusted p-values for the generalized null associated with a treatment. Repeat this process *L* times so that we have many sets of bootstrap samples. Note that we do not need to draw all of the data. We only retain the dummy variable associated with each treatment and bootstrap sample for whether we falsely rejected all null hypotheses in step 5 above ( $\delta_{ik}$ ).
- 2. For every treatment k and sample of bootstraps l, calculate the mean of  $\delta_{ik}$  for all bootstrap samples selected as part of  $l(\bar{\delta}_{lk})$ .

3. Identify every sample of bootstraps l where  $\overline{\delta}_{lk}$  is less than the uncorrected p-value from step 5 above  $\overline{\delta}_k$ . The fraction of samples of bootstraps where this is true provides the adjusted p-value.

## **Detailed Description of Exploratory Analysis (see Figure B2)**

For any district behaviors/actions where we find statistically significant impacts on some outcome in some grade (or grade span), we will examine the individual estimates on the treatment variable associated with each outcome and grade for test scores (or grade span for attendance). Specifically, we can look at the F-tests for assessment scores, assessment proficiency, attendance, and chronic absence, and only look at the set of estimates for an outcome if the specific F-test rejects at the 5% level. For performance outcomes (assessment scores and proficiency), we will look at each individual grade given State Department of Education concerns about pooling assessment data across grades (4 models). For attendance outcomes (attendance and chronic absenteeism), we will focus on pooled analyses by grade span: early elementary (K-2), late elementary, middle school and high school (10 models). While we may not have statistical precision to establish that treatment effects exist for a specific grade (or grade span) and outcome, it will be policy-relevant to know which grades and which outcomes are primarily driving the significant finding for a given district treatment.

We also may look at heterogeneous effects across schools or students for specific grades and outcomes where we observe sizable relationships between treatment and outcomes. In order to address concerns about Type-1 error in such investigations, we will only examine outcome by grade (or grade span) samples if we reject the null hypothesis of zero treatment effects for that sample at the 5% level. Then, we take an approach similar to the null hypothesis utilized in Gelman, Hill and Yajima (2012). Specifically, they specify the null hypothesis for whether the estimated effect is the same across all groups.

In our case, we will divide students or schools based on composition into observationally similar subgroups based on same racial/ethnic category (Non-Hispanic African American, Non-Hispanic all other races, Hispanic), free or reduced-price lunch status (eligible or ineligible), and English Learner status (EL or non-EL). We then implement this test for heterogeneous effects across the 12 resulting categories as an F-test interacting treatment with a dummy associated with each subgroup, omitting one subgroup, and then running an F-test of the full set of 11 interactions. As with our analysis on outcomes by grade (or grade span), we will only report the individual interactions if the overall F-test is significant at the 5% level for the purpose of documenting the specific groups that were most influential in the rejection of the null hypothesis of equal treatment effects.
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# Appendix C: Implementation of remote learning (Research Goal 1)

Research Question 1a. What remote learning formats did districts use and how did these learning formats vary by district type?

	(1) Grades 1st	(2) Grades 6th	(3) Grades 9th
Controls	through 5th	through 8th	through 12th
Percent of students high needs: FRPL, SWD, or ELL	-1.840***	-2.411***	-1.731***
in school attended	(0.316)	(0.383)	(0.510)
District is a RESC, Charter or CTECS	2.359	2.629*	0.184
	(1.484)	(1.505)	(1.159)
District RESC/Charter/CTECS*Percent of students	-3.871*	-3.667*	-0.0266
high needs in school	(2.007)	(1.963)	(1.611)
Observations	10,146	4,480	4,746
Fraction of Students with Sept In-person Option	0.914	0.925	0.902
25th Percentile Share High Needs Students	0.251	0.247	0.238
75th Percentile Share High Needss Students	0.703	0.694	0.606
Estimated Probability of In-person Option			
Traditional Public (25th percentile high needs)	0.977	0.989	0.958
Traditional Public (75th percentile high needs)	0.876	0.887	0.864
RESC/Charter/CTECS (25th percentile high needs)	0.847	0.916	0.956
RESC/Charter/CTECS (75th percentile high needs)	0.061	0.081	0.856

#### Table C1. In-Person Option Available in September

Note: The top panel shows the results of a probit model regressing in person/hybrid learning mode on school share of students who are high needs, whether the Local Education Agency represents a school choice option, and the interaction of these two variables. Columns 1 through 3 present results for elementary, middle and high school grades, respectively. The bottom panel presents the fraction of students with an in person/hybrid option in September, and the school share of high needs students at the 25th and 75th percentiles. The final rows in the bottom panel present the model based predicted likelihood of in person/hybrid option at the 25th and 75th percentiles of share high needs.

Table C1 presents the initial/September decision to offer hybrid or fully in-person learning as the primary learning mode. We divide the population of students into three subsamples by grade level: 1<sup>st</sup>-5<sup>th</sup>, 6<sup>th</sup>-8<sup>th</sup>, and 9<sup>th</sup>-12<sup>th</sup> following the most common grade configuration of elementary, middle and high schools in the state, but all results below are very similar if we analyze each grade separately.<sup>1</sup> The top panel presents the estimates showing that the likelihood of students having an in-person option in September falls with the share of high need students, and this relationship is even stronger for the subsample composed of students in charter schools and in

<sup>&</sup>lt;sup>1</sup> Districts do vary in grade composition so that some middle schools will be represented in 1<sup>st</sup>-5<sup>th</sup> or 9<sup>th</sup>-12<sup>th</sup> and some elementary schools in 6<sup>th</sup>-8<sup>th</sup>. The use of school fixed effects helps to address this issue. Further, as noted, this problem will not arise with analyses at the individual grade level and all results are robust

schools managed by the RESCs and CTECS.<sup>2</sup> The bottom panel presents the fraction of students in the state that were provided with an in-person option in September for each of the three grade subsamples, as well as the 25<sup>th</sup> and 75<sup>th</sup> percentile school share of high need students within the state's student population. The share of students with an in-person option is 91% at the elementary school level, and 93% and 90% for middle and high school, respectively.

We then use these percentiles to predict the likelihood of a school providing an in-person option at a hypothetical school that was at the 25<sup>th</sup> and 75<sup>th</sup> percentiles of share of students with high needs. The 25<sup>th</sup> percentile is between 24% and 25% percent depending upon grade level, but the 75<sup>th</sup> percentile ranges more broadly between about 70% for elementary and middle school and 60% for high school. For traditional public schools, an in-person option in September was available to over 95% of students, 98% of elementary and middle school students, at the 25<sup>th</sup> percentile and available to 86% to 89% of students at the 75<sup>th</sup> percentile of share high needs. Looking at the RESCs, Charters and CTECS, percentages were relatively high at the 25<sup>th</sup> percentile ranging between 85% and 96%, but fall dramatically with share high needs in elementary and middle school with some in person being available to only 6% to 9% of students at the 75<sup>th</sup> percentile share.

 $<sup>^{2}</sup>$  We combine public and regional school districts because regional school districts are traditional public schools that are jointly under the supervision of and locally funded by a combination of towns. We also include endowed schools with town school districts because those endowed schools traditionally were affiliated with a specific town and received and in some cases still receive support from that town.

	(1) Grades 1st	(2) Grades 6th	(3) Grades 9th
Controls	through 5th	through 8th	through 12th
Percent of students high needs: FRPL, SWD, or ELL	-0.320***	-0.237***	-0.183***
in school attended	(0.0380)	(0.0507)	(0.0600)
Regional School District	0.293	0.0714	-0.00722
	(0.264)	(0.113)	(0.0766)
Regional School District*Percent of students high needs	-0.783	0.125	0.173
	(0.995)	(0.444)	(0.300)
Regional Education Service Centers or Charters	0.628***	0.685***	0.118
	(0.217)	(0.262)	(0.257)
Regional Education Service Centers or Charters*Percent	-0.901***	-0.912***	0.107
of students high needs	(0.305)	(0.338)	(0.381)
Endowed Schools		-0.241***	-0.284***
		(0.0135)	(0.0227)
Endowed Schools*Percent of students high needs			0.205***
			(0.0615)
Connecticut Technical Education Career System			-0.230***
			(0.0227)
Observations	9,657	3,469	3,859
Average Share of Days with In Person Option	0.720	0.649	0.567
Estimated Share of Days with In Person Option			
Traditional Public (25th percentile high needs)	0.776	0.696	0.605
Traditional Public (75th percentile high needs)	0.717	0.613	0.549
RESC and Charter (25th percentile high needs)	0.982	0.981	0.889
RESC and Charter (75th percentile high needs)	0.633	0.719	0.762
Endowed School (25th percentile high needs)		0.474	0.369
Endowed School (75th percentile high needs)		0.389	0.377

# Table C2. Share of Days in Person Available Through End of School Year

Note: The top panel shows the results of a tobit model regressing share of days in person offered for the entire school year on school share of students who are high needs, dummy variables for the type of Local Education Agency, and the interaction of these variables. Columns 1 through 3 present results for elementary, middle and high school grades, respectively. The bottom panel presents the average share of days in person. The rest of the rows in the bottom panel predicted share of days in person at the 25th and 75th percentiles of share high needs.

Table C2 presents the share of days that were offered in-person over the entire school year. Again, the estimates are shown in the top panel of the table. As in September, share of in person days available falls as the school share of high need students increases, although this effect weakens for higher grade levels. We cannot detect any differences between town based school districts and regional school districts, although estimates are very noisy at lower grade levels where regional school districts have minimal representation. The negative relationship between share high needs and having in person opportunities is even stronger for the charter/RESC subsample in elementary and middle school grades, but the relationship is much weaker at endowed high schools.<sup>3</sup>

The bottom panel shows the average of share of days provided in-person: 72% for elementary, 70% for middle and 60% for high school grades and the expected share based on the 25<sup>th</sup> and 75<sup>th</sup> percentiles of share high need students separately for different types of schools. For traditional public schools, we observe approximately a 6 to 8 percentage point lower share of days provided in-person at the 75<sup>th</sup> percentile share high needs relative to the 25<sup>th</sup> percentile. These differences are even larger for RESCs and Charter schools: 35 percentage points for elementary, 26 points for middle and 13 points for high school grades. Endowed schools have on average substantially lower shares of in person days: 47% for middle school and 37% for high school at the 25<sup>th</sup> percentile, but for endowed high schools the share in person is unaffected by school share of high need students.

<sup>&</sup>lt;sup>3</sup> CTECS is one district with a single value for share of in person days and so the estimate on share high needs across the technical high schools is meaningless, opposite in sign and identical in magnitude to level estimate. Only one endowed middle exists in the state so the effect of share high needs for that school is unidentified.

			·····
	(1)	(2)	(3)
VARIABLES	Oct_Dec	Jan_Mar	Apr_Jun
Share of Days Offered in Person for the Same Month	0.646***	0.651***	0.591***
	(0.0388)	(0.0316)	(0.0752)
Observations	1,401,411	1,388,433	1,279,065
R-squared	0.311	0.260	0.114
Share of Days Offered in Person for the Same Month	0.923***	0.849***	0.657***
	(0.0455)	(0.0537)	(0.141)
Percent of students high needs: FRPL, SWD, or ELL	0.0318	0.0413	-0.0804
	(0.0548)	(0.0796)	(0.280)
Share of Days in offered person* Percent of students high			
needs	-0.562***	-0.467***	-0.287
	(0.0900)	(0.0965)	(0.294)
Observations	1,398,156	1,385,238	1,276,179
R-squared	0.359	0.292	0.153
Average of Share Monthly In Person Enrollment Days	0.3741658	0.4145769	0.6823971
Average of Share of Days Offered in Person by Month	0.5316727	.6075055	0.8437183
Share days in person effect at 25th percentile high needs	0.756	0.710	0.572
Share days in person effect at 75th percentile high needs	0.519	0.514	0.451

#### Table C3. Monthly In-Person Enrollment Days as a Share of Total Enrollment Days

Note: The top panel shows the results from a linear regression of share of days a student is enrolled in person during a given month on the share of days offered in person by that school in the same month. The second panel presents estimates adding controls for the share of students who are high needs and the interaction of share high needs with share of days offered in person. Columns 1 through 3 present results for Oct-Dec, Jan-Mar and Apr-Jun, respectively. The bottom panel presents the average share of enrollment days in person, the average share of days offered in person, and the estimated effect of share days offered in person calculated at the 25th and 75th percentiles using the estimates from panel 2.

Next, we examined rates at which students enroll in person as a function of the share of days offered in person. These results are shown in Table 3 separately for Oct-Dec, Jan-Mar and Apr-June in each column. The first panel presents the simple relationship between share enrolled and share available. The estimate ranges between 0.59 and 0.65 implying that if 10 additional days were available in person one would observe on average six to six and one half additional days of in-person enrollment per student. However, since virtually all districts required students to choose between all remote and the primary learning mode, a better interpretation of these estimates is that approximately six out of ten students enrolled in-person for all available days and four students continued with remote learning. The second panel estimates a model interacting the share of days in person with the school share of high needs students. Estimates on these interactions are strongly negative for the fall and winter, and the level estimate on share in person increases to 0.92 and 0.85 for elementary and middle school grades, where an estimate of one would be consistent with perfect take-up.

The first two rows of the bottom panel present the average of the student share of enrollment days that are recorded as in person and the average share of days available in-person based on the weekly learning mode. As the year progressed, the share of days available in person and the share of days students enrolled in person education increased, but there was a steady gap of

between 16 and 19 percentage points. The last two rows use the estimates from the second panel to predict the effect of share in-person provided for a hypothetical school at the 25<sup>th</sup> and 75<sup>th</sup> percentiles of share of students with high needs. For elementary and middle schools, we observe a sizable gap with 70% to 75% of students appearing to respond to a school offering more days in-person at the 25<sup>th</sup> percentile of share high needs, but just over 50% of students responding at the 75<sup>th</sup> percentile. In the spring, we observe less responsiveness overall to increases in in-person learning availability, but the influence of share high needs has declined with 57% of days in person at the 25<sup>th</sup> percentile of share high needs and 45% in person at the 75<sup>th</sup> percentile.

We also hypothesized that the students from schools with a larger share of high needs students might respond more slowly to the provision of more in person days, as opposed to simply having lower responsiveness overall. We did explore models that included lags to allow for such a delayed response to new in person offering, but we did not find evidence of such behavior. The data appears more consistent with simply a lower response rate among students in high needs schools to the provision of hybrid or in-person learning opportunities.

#### Table C5. District-reported learning models by grade level in May 2020

District Inventory Q5. As of May 1, 2020, what did learning look like when students from the following grade levels were learning from home?

						Distri	ict Type		
		Ov	verall	Allianc	e districts	Non-Allia	nce districts	APS	SEPs
		Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid
		Count	Percent	Count	Percent	Count	Percent	Count	Percent
Elementary School	Fully asynchronous without technology	5	2.6	2	6.3	2	1.6	1	2.9
	Fully asynchronous with technology	30	15.5	5	15.6	23	18.0	2	5.9
	Partially synchronous	100	51.5	14	43.8	74	57.8	12	35.3
	Fully synchronous	59	30.4	11	34.4	29	22.7	19	55.9
	Total N	194	100.0	32	100.0	128	100.0	34	100.0
Middle School	Fully asynchronous without technology	3	1.6	1	3.2	1	.8	1	2.6
	Fully asynchronous with technology	29	15.4	4	12.9	22	18.5	3	7.9
	Partially synchronous	86	45.7	15	48.4	61	51.3	10	26.3
	Fully synchronous	70	37.2	11	35.5	35	29.4	24	63.2
	Total N	188	100.0	31	100.0	119	100.0	38	100.0
High School	Fully asynchronous without technology	2	1.2	1	3.3	1	1.0	0	.0
	Fully asynchronous with technology	28	16.3	4	13.3	18	18.4	6	13.6
	Partially synchronous	72	41.9	13	43.3	45	45.9	14	31.8
	Fully synchronous	70	40.7	12	40.0	34	34.7	24	54.5
	Total N	172	100.0	30	100.0	98	100.0	44	100.0

Please note that the response options were listed as follows: Fully asynchronous without technology: assignments were distributed in print format and no online/electronic learning materials were provided; Fully asynchronous with technology: students had no classes conducted in real time through video conferencing (for example, Google Meet or Zoom), but online/electronic learning materials were provided (e.g., online activities, instructional videos, etc.); Partially synchronous: students had at least one class meeting conducted in real time through video conferencing (for example, Google Meet or Zoom); Fully synchronous: the majority of students' classes took place in real time, through video conferencing (for example, Google Meet or Zoom)

#### Table C6. Teacher-reported use of learning models by grade level in spring 2020

Teacher Survey Q6. Which of the following models most closely describes how you taught the majority of your students in the first months of the COVID-19 pandemic? (March-June 2020). Please select all that apply.

		District Type					
		Ov	erall	Alliance	e districts	Non-Allia	nce districts
		Valid	Valid	Valid	Valid	Valid	Valid
		Count	Percent	Count	Percent	Count	Percent
Elementary school	Fully in-person instruction	18	1.9	8	2.0	10	1.8
	Hybrid model, with in-person instruction and remote instruction at the same time	24	2.5	16	4.0	8	1.4
	Hybrid model, with in-person instruction and remote instruction at different times	17	1.8	10	2.5	7	1.2
	Fully remote instruction, where students received at least one real-time class each school day	467	48.7	173	43.6	294	52.3
	Fully remote instruction, where students received less than one real-time class each school day	487	50.8	212	53.4	275	48.9
	Unable to continue instruction	25	2.6	18	4.5	7	1.2
	Total N	959	100.0	397	100.0	562	100.0
Middle school	Fully in-person instruction	8	1.4	3	1.7	5	1.3
	Hybrid model, with in-person instruction and remote instruction at the same time	10	1.8	2	1.1	8	2.1
	Hybrid model, with in-person instruction and remote instruction at different times	7	1.3	4	2.3	3	.8
	Fully remote instruction, where students received at least one real-time class each school day	265	47.8	82	46.9	183	48.3
	Fully remote instruction, where students received less than one real-time class each school day	295	53.2	92	52.6	203	53.6
	Unable to continue instruction	6	1.1	3	1.7	3	.8
	Total N	554	100.0	175	100.0	379	100.0
High school	Fully in-person instruction	25	2.9	15	5.4	10	1.7
	Hybrid model, with in-person instruction and remote instruction at the same time	18	2.1	7	2.5	11	1.8
	Hybrid model, with in-person instruction and remote instruction at different times	10	1.1	6	2.2	4	.7
	Fully remote instruction, where students received at least one real-time class each school day	407	46.7	141	51.1	266	44.6
	Fully remote instruction, where students received less than one real-time class each school day	468	53.7	126	45.7	342	57.4
	Unable to continue instruction	11	1.3	4	1.4	7	1.2
	Total N	872	100.0	276	100.0	596	100.0
Multiple levels,	Fully in-person instruction	6	1.8	4	3.7	2	.9
ungraded, or	Hybrid model, with in-person instruction and remote instruction at the same time	11	3.4	8	7.4	3	1.4
unknown	Hybrid model, with in-person instruction and remote instruction at different times	4	1.2	2	1.9	2	.9
	Fully remote instruction, where students received at least one real-time class each school day	173	52.7	53	49.1	120	54.5
	Fully remote instruction, where students received less than one real-time class each school day	144	43.9	44	40.7	100	45.5
	Unable to continue instruction	12	3.7	5	4.6	7	3.2
	Total N	328	100.0	108	100.0	220	100.0

Please note that the response options were listed as follows: Fully in-person instruction; Hybrid model where I provided in-person instruction concurrently (i.e., at the same time); Hybrid model, where I provided in-person instruction and remote instruction at different times (not concurrently); Fully remote instruction, where my students received at least one synchronous/real-time class each school day (for example, classes via zoom); Fully remote instruction, where my students received less than one synchronous/real-time class each school day (i.e., instruction via paper workbooks or asynchronous videos); I was unable to continue instruction.

#### **Table C7. District-reported learning models for fully remote students by grade level during the 2020-21 school year** *District Inventory Q29. During the 2020-21 school year, what did learning look like for fully remote students at the following grade levels?*

						Distri	ct Type		
		Ov	erall	Alliance	e districts	Non-Allia	nce districts	AP	SEPs
		Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid
		Count	Percent	Count	Percent	Count	Percent	Count	Percent
Elementary School	Fully asynchronous without technology	3	1.6	0	.0	2	1.6	1	3.3
	Fully asynchronous with technology	9	4.8	2	6.1	5	4.0	2	6.7
	Partially synchronous	75	40.1	12	36.4	51	41.1	12	40.0
	Fully synchronous	100	53.5	19	57.6	66	53.2	15	50.0
	Total	187	100.0	33	100.0	124	100.0	30	100.0
Middle School	Fully asynchronous without technology	1	.6	0	.0	0	.0	1	2.9
	Fully asynchronous with technology	9	5.0	0	.0	7	6.1	2	5.7
	Partially synchronous	57	31.7	10	32.3	37	32.5	10	28.6
	Fully synchronous	113	62.8	21	67.7	70	61.4	22	62.9
	Total	180	100.0	31	100.0	114	100.0	35	100.0
High School	Fully asynchronous without technology	2	1.2	1	3.2	0	.0	1	2.3
	Fully asynchronous with technology	4	2.3	0	.0	3	3.1	1	2.3
	Partially synchronous	47	27.3	8	25.8	26	26.8	13	29.5
	Fully synchronous	119	69.2	22	71.0	68	70.1	29	65.9
	Total	172	100.0	31	100.0	97	100.0	44	100.0

Please note that the response options were listed as follows: Fully asynchronous without technology: assignments were distributed in print format and no online/electronic learning materials were provided; Fully asynchronous with technology: students had no classes conducted in real time through video conferencing (for example, Google Meet or Zoom), but online/electronic learning materials were provided (e.g., online activities, instructional videos, etc.); Partially synchronous: students had at least one class meeting conducted in real time through video conferencing (for example, Google Meet or Zoom); Fully synchronous: the majority of students' classes took place in real time, through video conferencing (for example, Google Meet or Zoom); Fully synchronous: the majority of students' classes took place in real time, through video conferencing (for example, Google Meet or Zoom); Fully synchronous: the majority of students' classes took place in real time, through video conferencing (for example, Google Meet or Zoom); Fully synchronous: the majority of students' classes took place in real time, through video conferencing (for example, Google Meet or Zoom); Fully synchronous: the majority of students' classes took place in real time, through video conferencing (for example, Google Meet or Zoom); Fully synchronous: the majority of students' classes took place in real time, through video conferencing (for example, Google Meet or Zoom); Fully synchronous: the majority of students' classes took place in real time, through video conferencing (for example, Google Meet or Zoom); Fully synchronous: the majority of students' classes took place in real time, through video conferencing (for example, Google Meet or Zoom); Fully synchronous: the majority of students' classes took place in real time, through video conferencing (for example, Google Meet or Zoom); Fully synchronous; for example, Google Meet or Zoom); Fully synchronous; for example, Google Meet or Zoom); Fully synchronous; for example, Google Meet or Zoom; for ex

#### Table C8. District-reported learning models for hybrid students by grade level during the 2020-21 school year

District Inventory Q34. During the 2020-21 school year, what did learning look like for hybrid students from the following grade levels?

						Distric	et Type		
		Ov	erall	Alliance	e districts	Non-Allia	nce districts	APS	SEPs
		Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid
		Count	Percent	Count	Percent	Count	Percent	Count	Percent
Elementary School	Fully asynchronous without technology	3	2.0	2	6.9	0	.0	1	4.5
	Fully asynchronous with technology	13	8.7	3	10.3	9	9.1	1	4.5
	Partially synchronous	72	48.0	14	48.3	48	48.5	10	45.5
	Fully synchronous	62	41.3	10	34.5	42	42.4	10	45.5
	Total	150	100.0	29	100.0	99	100.0	22	100.0
Middle School	Fully asynchronous without technology	2	1.3	1	3.7	0	.0	1	3.6
	Fully asynchronous with technology	11	7.0	2	7.4	7	6.8	2	7.1
	Partially synchronous	56	35.4	9	33.3	36	35.0	11	39.3
	Fully synchronous	89	56.3	15	55.6	60	58.3	14	50.0
	Total	158	100.0	27	100.0	103	100.0	28	100.0
High School	Fully asynchronous without technology	2	1.3	1	3.7	0	.0	1	2.9
	Fully asynchronous with technology	8	5.2	1	3.7	4	4.3	3	8.8
	Partially synchronous	46	30.1	9	33.3	24	26.1	13	38.2
	Fully synchronous	97	63.4	16	59.3	64	69.6	17	50.0
	Total	153	100.0	27	100.0	92	100.0	34	100.0

Please note that the response options were listed as follows: Fully asynchronous without technology: assignments were distributed in print format and no online/electronic learning materials were provided; Fully asynchronous with technology: students had no classes conducted in real time through video conferencing (for example, Google Meet or Zoom), but online/electronic learning materials were provided (e.g., online activities, instructional videos, etc.); Partially synchronous: students had at least one class meeting conducted in real time through video conferencing (for example, Google Meet or Zoom); Fully synchronous: the majority of students' classes took place in real time, through video conferencing (for example, Google Meet or Zoom); Fully synchronous: the majority of students' classes took place in real time, through video conferencing (for example, Google Meet or Zoom); Fully synchronous: the majority of students' classes took place in real time, through video conferencing (for example, Google Meet or Zoom); Fully synchronous: the majority of students' classes took place in real time, through video conferencing (for example, Google Meet or Zoom); Fully synchronous: the majority of students' classes took place in real time, through video conferencing (for example, Google Meet or Zoom)

#### Table C9. Teacher-reported use of learning models by grade level in school year 2020-21

Teacher Survey Q9. Which of the following models did you use to teach your students during the 2020-21 school year? Please select all that apply.

		District Type					
		Ov	verall	Alliar	ce districts	Non-All	iance districts
		Valid	Valid	Valid		Valid	
		Count	Percent	Count	Valid Percent	Count	Valid Percent
Elementary school	Fully in-person instruction	285	28.7	81	19.6	204	35.1
	Hybrid model, with in-person instruction and remote instruction at the same time	644	64.8	262	63.4	382	65.7
	Hybrid model, with in-person instruction and remote instruction at different times	305	30.7	138	33.4	167	28.7
	Fully remote instruction, where students received at least one real-time class each school day	298	30.0	136	32.9	162	27.9
	Fully remote instruction, where students received less than one real-time class each school day	44	4.4	17	4.1	27	4.6
	Total N	994	100.0	413	100.0	581	100.0
Middle school	Fully in-person instruction	136	23.8	31	16.8	105	27.1
	Hybrid model, with in-person instruction and remote instruction at the same time	487	85.1	144	78.3	343	88.4
	Hybrid model, with in-person instruction and remote instruction at different times	108	18.9	39	21.2	69	17.8
	Fully remote instruction, where students received at least one real-time class each school day	150	26.2	57	31.0	93	24.0
	Fully remote instruction, where students received less than one real-time class each school day	23	4.0	5	2.7	18	4.6
	Total N	572	100.0	184	100.0	388	100.0
High school	Fully in-person instruction	171	19.6	44	16.1	127	21.2
	Hybrid model, with in-person instruction and remote instruction at the same time	754	86.6	210	76.9	544	91.0
	Hybrid model, with in-person instruction and remote instruction at different times	161	18.5	66	24.2	95	15.9
	Fully remote instruction, where students received at least one real-time class each school day	265	30.4	99	36.3	166	27.8
	Fully remote instruction, where students received less than one real-time class each school day	35	4.0	12	4.4	23	3.8
	Total N	871	100.0	273	100.0	598	100.0
Multiple levels,	Fully in-person instruction	72	21.1	15	13.5	57	24.8
ungraded, or unknown	Hybrid model, with in-person instruction and remote instruction at the same time	237	69.5	82	73.9	155	67.4
	Hybrid model, with in-person instruction and remote instruction at different times	109	32.0	38	34.2	71	30.9
	Fully remote instruction, where students received at least one real-time class each school day	86	25.2	29	26.1	57	24.8
	Fully remote instruction, where students received less than one real-time class each school day	23	6.7	6	5.4	17	7.4
	Total N	341	100.0	111	100.0	230	100.0

Please note that the response options were listed as follows for learning models used during 2020-21 school year: Fully in-person instruction; Hybrid model where I provided in-person instruction and remote instruction concurrently (i.e., at the same time); Hybrid model, where I provided in-person instruction and remote instruction at different times (not concurrently); Fully remote instruction, where my students received at least one synchronous/real-time class each school day (for example, classes via zoom); Fully remote instruction, where my students received less than one synchronous/real-time class each school day (i.e., instruction via paper workbooks or asynchronous videos).

# Table C10. Teacher-reported percentage of students by grade level in each learning model in 2020-21

Teacher Survey Q10. Approximately what percentage of your students attended school in each of the following ways for the majority of the 2020-21 school year?

			District Type								
			Overall		А	lliance distri	cts	Non-Alliance districts			
			Mean		Mean						
		Ν	Percent	(SD)	Ν	Percent	(SD)	Ν	Percent	(SD)	
Elementary school	fully in-person learning	994	44.5	(38.0)	413	34.0	(34.6)	581	52.0	(38.5)	
	hybrid learning	994	31.1	(35.5)	413	36.0	(35.0)	581	27.6	(35.5)	
	fully remote learning	994	24.4	(28.6)	413	30.0	(30.0)	581	20.4	(26.8)	
Middle school	fully in-person learning	572	33.5	(34.4)	184	26.5	(31.2)	388	36.9	(35.4)	
	hybrid learning	572	45.3	(34.9)	184	43.5	(31.3)	388	46.2	(36.4)	
	fully remote learning	572	21.2	(21.7)	184	30.0	(26.2)	388	17.0	(17.7)	
High school	fully in-person learning	871	21.8	(28.3)	273	17.6	(24.7)	598	23.8	(29.6)	
	hybrid learning	871	50.1	(33.0)	273	39.6	(31.5)	598	54.9	(32.5)	
	fully remote learning	871	28.0	(26.6)	273	42.8	(32.2)	598	21.3	(20.4)	
Multiple levels,	fully in-person learning	341	41.9	(35.8)	111	32.8	(31.6)	230	46.3	(36.9)	
ungraded, or	hybrid learning	341	33.3	(33.5)	111	35.7	(30.0)	230	32.1	(35.0)	
unknown	fully remote learning	341	24.8	(25.9)	111	31.5	(27.2)	230	21.6	(24.6)	

Please note, mean percent describes the mean of each participating district's reported value.

# Research Question 1b. What general curricular student learning outcomes were targeted?

# Table C11. District-reported primary goal for core academic subjects in spring 2020

District Inventory Q6. During spring 2020, what was the district's primary learning goal for core academic subjects when students from the following grade levels were learning from home? Please select the best answer for each grade level.

				District Type						
		Ov	erall	Alliance	e districts	Non-Allia	nce districts	APS	SEPs	
	_	Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid	
		Count	Percent	Count	Percent	Count	Percent	Count	Percent	
Elementary School	Maintain contact with students	41	21.0	7	21.9	23	17.7	11	33.3	
	Minimize learning loss	54	27.7	10	31.3	33	25.4	11	33.3	
	Continue on-grade learning	99	50.8	15	46.9	74	56.9	10	30.3	
	Provide enrichment opportunities for self- motivated students	0	.0	0	.0	0	.0	0	.0	
	Remote learning did not occur in core academic subjects	1	.5	0	.0	0	.0	1	3.0	
	Total	195	100.0	32	100.0	130	100.0	33	100.0	
Middle School	Maintain contact with students	38	20.1	8	25.8	19	15.8	11	28.9	
	Minimize learning loss	47	24.9	9	29.0	27	22.5	11	28.9	
	Continue on-grade learning	102	54.0	14	45.2	73	60.8	15	39.5	
	Provide enrichment opportunities for self- motivated students	0	.0	0	.0	0	.0	0	.0	
	Remote learning did not occur in core academic subjects	2	1.1	0	.0	1	.8	1	2.6	
	Total	189	100.0	31	100.0	120	100.0	38	100.0	
High School	Maintain contact with students	35	20.1	7	23.3	15	15.2	13	28.9	
	Minimize learning loss	43	24.7	8	26.7	21	21.2	14	31.1	
	Continue on-grade learning	95	54.6	15	50.0	62	62.6	18	40.0	
	Provide enrichment opportunities for self- motivated students	0	.0	0	.0	0	.0	0	.0	
	Remote learning did not occur in core academic subjects	1	.6	0	.0	1	1.0	0	.0	
	Total	174	100.0	30	100.0	99	100.0	45	100.0	

# Table C12. District-reported primary goal for music, art, health & PE in spring 2020

District Inventory Q7. During spring 2020, what was the district's primary learning goal for music, art, health, and PE classes when students from the following grade levels were learning from home? Please select the best answer for each grade level.

						Distric	et Type		
	-	Ov	erall	Alliance	e districts	Non-Allia	nce districts	APS	SEPs
	_	Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid
		Count	Percent	Count	Percent	Count	Percent	Count	Percent
Elementary School	Maintain contact with students	71	37.2	13	41.9	42	33.1	16	48.5
	Minimize learning loss	24	12.6	5	16.1	14	11.0	5	15.2
	Continue on-grade learning	56	29.3	6	19.4	43	33.9	7	21.2
	Provide enrichment opportunities for self- motivated students	34	17.8	7	22.6	25	19.7	2	6.1
	Remote learning did not occur in these areas	6	3.1	0	.0	3	2.4	3	9.1
	Total	191	100.0	31	100.0	127	100.0	33	100.0
Middle School	Maintain contact with students	60	32.6	12	40.0	33	28.4	15	39.5
	Minimize learning loss	31	16.8	5	16.7	15	12.9	11	28.9
	Continue on-grade learning	61	33.2	6	20.0	48	41.4	7	18.4
	Provide enrichment opportunities for self- motivated students	28	15.2	7	23.3	19	16.4	2	5.3
	Remote learning did not occur in these areas	4	2.2	0	.0	1	.9	3	7.9
	Total	184	100.0	30	100.0	116	100.0	38	100.0
High School	Maintain contact with students	56	32.9	11	37.9	27	28.1	18	40.0
	Minimize learning loss	30	17.6	5	17.2	13	13.5	12	26.7
	Continue on-grade learning	64	37.6	7	24.1	48	50.0	9	20.0
	Provide enrichment opportunities for self- motivated students	14	8.2	6	20.7	7	7.3	1	2.2
	Remote learning did not occur in these areas	6	3.5	0	.0	1	1.0	5	11.1
	Total	170	100.0	29	100.0	96	100.0	45	100.0

# Table C13. District-reported primary goal for special services in spring 2020

District Inventory Q8. During spring 2020, what was the district's primary goal for special services (special education services and English Learner services) when eligible students from the following grade levels were learning from home? Please select the best answer for each grade level.

				District Type						
		Ov	erall	Alliance	e districts	Non-Allia	nce districts	APS	SEPs	
	_	Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid	
		Count	Percent	Count	Percent	Count	Percent	Count	Percent	
Elementary School	Maintain contact with students	39	20.0	7	21.9	21	16.3	11	32.4	
	Minimize learning loss	66	33.8	13	40.6	43	33.3	10	29.4	
	Continue on-grade learning	89	45.6	12	37.5	65	50.4	12	35.3	
	Provide enrichment opportunities for self- motivated students	0	.0	0	.0	0	.0	0	.0	
	Remote learning did not occur in these areas	1	.5	0	.0	0	.0	1	2.9	
	Total	195	100.0	32	100.0	129	100.0	34	100.0	
Middle School	Maintain contact with students	38	20.1	7	22.6	19	16.0	12	30.8	
	Minimize learning loss	64	33.9	13	41.9	40	33.6	11	28.2	
	Continue on-grade learning	86	45.5	11	35.5	60	50.4	15	38.5	
	Provide enrichment opportunities for self- motivated students	0	.0	0	.0	0	.0	0	.0	
	Remote learning did not occur in these areas	1	.5	0	.0	0	.0	1	2.6	
	Total	189	100.0	31	100.0	119	100.0	39	100.0	
High School	Maintain contact with students	39	22.5	6	20.0	18	18.4	15	33.3	
	Minimize learning loss	59	34.1	12	40.0	33	33.7	14	31.1	
	Continue on-grade learning	75	43.4	12	40.0	47	48.0	16	35.6	
	Provide enrichment opportunities for self- motivated students	0	.0	0	.0	0	.0	0	.0	
	Remote learning did not occur in these areas	0	.0	0	.0	0	.0	0	.0	
	Total	173	100.0	30	100.0	98	100.0	45	100.0	

**Table C14. District-reported primary goal (overall) for fully remote students in 2020-21**District Inventory Q30. During the 2020-21 school year, what was the district's primary goal for teachers of fully remote students at each of the following levels?

						Distric	t Type		
		Ov	erall	Alliance	e districts	Non-Allia	nce districts	APS	SEPs
	_	Valid Count	Valid Percent	Valid Count	Valid Percent	Valid Count	Valid Percent	Valid Count	Valid Percent
Elementary School	Maintain contact with students	12	6.3	1	3.0	7	5.6	4	13.3
2	Minimize learning loss	26	13.8	5	15.2	14	11.1	7	23.3
	Continue on-grade learning	142	75.1	26	78.8	99	78.6	17	56.7
	Provide enrichment opportunities for self- motivated students	1	.5	0	.0	0	.0	1	3.3
	Other (please describe):	8	4.2	1	3.0	6	4.8	1	3.3
	Total	189	100.0	33	100.0	126	100.0	30	100.0
Middle School	Maintain contact with students	10	5.5	1	3.2	5	4.3	4	11.4
vildale School	Minimize learning loss	24	13.2	6	19.4	13	11.2	5	14.3
	Continue on-grade learning	143	78.6	24	77.4	95	81.9	24	68.6
	Provide enrichment opportunities for self- motivated students	1	.5	0	.0	0	.0	1	2.9
	Other (please describe):	4	2.2	0	.0	3	2.6	1	2.9
	Total	182	100.0	31	100.0	116	100.0	35	100.0
High School	Maintain contact with students	18	10.4	1	3.2	9	9.2	8	18.2
	Minimize learning loss	25	14.5	6	19.4	10	10.2	9	20.5
	Continue on-grade learning	125	72.3	23	74.2	77	78.6	25	56.8
	Provide enrichment opportunities for self- motivated students	0	.0	0	.0	0	.0	0	.0
	Other (please describe):	5	2.9	1	3.2	2	2.0	2	4.5
	Total	173	100.0	31	100.0	98	100.0	44	100.0

# Table C15. District-reported primary goal (overall) for hybrid students in 2020-21

District Inventory Q35. During the 2020-21 school year, what was the district's primary goal teachers of hybrid students at the following levels on days when they were learning from home?

						Distri	ct Type		
		Ov	erall	Allianc	e districts	Non-Allia	nce districts	APS	SEPs
		Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid
		Count	Percent	Count	Percent	Count	Percent	Count	Percent
Elementary School	Maintain contact with students	8	4.9	1	3.1	2	1.9	5	20.0
	Minimize learning loss	24	14.6	6	18.8	12	11.2	6	24.0
	Continue on-grade learning	108	65.9	21	65.6	78	72.9	9	36.0
	Provide enrichment opportunities for self-	2	1.2	0	.0	0	.0	2	8.0
	Motivated students	22	12.4	4	10.5	15	14.0	2	12.0
	Other (please describe):	22	13.4	4	12.5	15	14.0	3	12.0
	lotal	164	100.0	32	100.0	107	100.0	25	100.0
Middle School	Maintain contact with students	11	6.6	1	3.3	5	4.7	5	16.7
vilule School	Minimize learning loss	25	15.0	7	23.3	12	11.2	6	20.0
	Continue on-grade learning	116	69.5	19	63.3	83	77.6	14	46.7
	Provide enrichment opportunities for self- motivated students	2	1.2	0	.0	0	.0	2	6.7
	Other (please describe):	13	7.8	3	10.0	7	6.5	3	10.0
	Total	167	100.0	30	100.0	107	100.0	30	100.0
High School	Maintain contact with students	12	7.5	1	3.3	6	6.6	5	13.2
	Minimize learning loss	22	13.8	5	16.7	9	9.9	8	21.1
	Continue on-grade learning	114	71.7	21	70.0	74	81.3	19	50.0
	Provide enrichment opportunities for self- motivated students	1	.6	0	.0	0	.0	1	2.6
	Other (please describe):	10	6.3	3	10.0	2	2.2	5	13.2
	Total	159	100.0	30	100.0	91	100.0	38	100.0

### Table C16. District-reported elementary school assessment practices prior to COVID-19

District Inventory Q42e 1. What data did your district use to assess how elementary students were doing prior to COVID-19?

	District Type								
	Ov	Overall Alliance districts Non-Allia					e districts APSEPs		
	Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	
Their attendance in class	179	93.7	33	100.0	117	92.9	29	90.6	
Their completed classroom tasks or assignments	181	94.8	30	90.9	123	97.6	28	87.5	
Their responses to a student survey (excluding social and emotional	82	42.9	12	36.4	61	48.4	9	28.1	
assessments)									
Their performance on a social and emotional assessment	48	25.1	8	24.2	22	17.5	18	56.3	
Their performance on classroom quizzes or tests	173	90.6	30	90.9	122	96.8	21	65.6	
Diagnostic or benchmark schoolwide assessments in English language arts	168	88.0	30	90.9	116	92.1	22	68.8	
Diagnostic or benchmark schoolwide assessments in mathematics	167	87.4	30	90.9	116	92.1	21	65.6	
Other (please describe):	16	8.4	3	9.1	7	5.6	6	18.8	
Total N	191	100.0	33	100.0	126	100.0	32	100.0	

# Table C17. District-reported middle school assessment practices prior to COVID-19

District Inventory Q42m 1. What data did your district use to assess how middle school students were doing prior to COVID-19?

	District Type								
	O	verall	Alliance	e districts	Non-Alliar	nce districts	APSEPs		
	Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	
Their attendance in class	179	97.3	31	100.0	114	98.3	34	91.9	
Their completed classroom tasks or assignments	175	95.1	28	90.3	113	97.4	34	91.9	
Their responses to a student survey (excluding social and emotional	73	39.7	12	38.7	53	45.7	8	21.6	
assessments)									
Their performance on a social and emotional assessment	48	26.1	8	25.8	24	20.7	16	43.2	
Their performance on classroom quizzes or tests	168	91.3	29	93.5	113	97.4	26	70.3	
Diagnostic or benchmark schoolwide assessments in English language arts	146	79.3	28	90.3	94	81.0	24	64.9	
Diagnostic or benchmark schoolwide assessments in mathematics	144	78.3	28	90.3	92	79.3	24	64.9	
Other (please describe):	17	9.2	3	9.7	7	6.0	7	18.9	
Total N	184	100.0	31	100.0	116	100.0	37	100.0	

# Table C18. District-reported high school assessment practices prior to COVID-19

District Inventory Q42h\_1. What data did your district use to assess how high school students were doing prior to COVID-19?

	District Type								
	O	verall	Alliance	e districts	Non-Alliar	nce districts	APS	SEPs	
	Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	
Their attendance in class	168	97.1	31	100.0	95	96.9	42	95.5	
Their completed classroom tasks or assignments	163	94.2	27	87.1	96	98.0	40	90.9	
Their responses to a student survey (excluding social and emotional	75	43.4	15	48.4	51	52.0	9	20.5	
assessments)									
Their performance on a social and emotional assessment	42	24.3	7	22.6	23	23.5	12	27.3	
Their performance on classroom quizzes or tests	152	87.9	27	87.1	95	96.9	30	68.2	
Diagnostic or benchmark schoolwide assessments in English language arts	122	70.5	25	80.6	74	75.5	23	52.3	
Diagnostic or benchmark schoolwide assessments in mathematics	120	69.4	25	80.6	72	73.5	23	52.3	
Other (please describe):	16	9.2	3	9.7	5	5.1	8	18.2	
Total N	173	100.0	31	100.0	98	100.0	44	100.0	

### Table C19. District-reported elementary school assessment practices in spring 2020

District Inventory Q42e\_2. What data did your district use to assess how elementary students were doing during spring 2020?

	District Type								
	0	verall	Alliance	districts	Non-Alliaı	nce districts	APSEPs		
	Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	
Their attendance in class	170	91.9	27	90.0	115	93.5	28	87.5	
Their completed classroom tasks or assignments	168	90.8	28	93.3	115	93.5	25	78.1	
Their responses to a student survey (excluding social and emotional	69	37.3	9	30.0	52	42.3	8	25.0	
assessments)									
Their performance on a social and emotional assessment	44	23.8	9	30.0	23	18.7	12	37.5	
Their performance on classroom quizzes or tests	128	69.2	21	70.0	90	73.2	17	53.1	
Diagnostic or benchmark schoolwide assessments in English language arts	78	42.2	12	40.0	54	43.9	12	37.5	
Diagnostic or benchmark schoolwide assessments in mathematics	77	41.6	12	40.0	54	43.9	11	34.4	
Other (please describe):	12	6.5	2	6.7	4	3.3	6	18.8	
Total N	185	100.0	30	100.0	123	100.0	32	100.0	

# Table C20. District-reported middle school assessment practices in spring 2020

District Inventory Q42m 2. What data did your district use to assess how middle school students were doing during spring 2020?

	District Type							
	Ove	erall	Allianc	e districts	Non-A	Alliance	APS	SEPs
					dis	tricts		
	Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid
	Count	Percent	Count	Percent	Count	Percent	Count	Percent
Their attendance in class	162	91.0	25	86.2	104	92.9	33	89.2
Their completed classroom tasks or assignments	164	92.1	26	89.7	107	95.5	31	83.8
Their responses to a student survey (excluding social and emotional	71	39.9	12	41.4	50	44.6	9	24.3
assessments)								
Their performance on a social and emotional assessment	41	23.0	7	24.1	21	18.8	13	35.1
Their performance on classroom quizzes or tests	132	74.2	21	72.4	89	79.5	22	59.5
Diagnostic or benchmark schoolwide assessments in English language arts	75	42.1	12	41.4	49	43.8	14	37.8
Diagnostic or benchmark schoolwide assessments in mathematics	74	41.6	12	41.4	48	42.9	14	37.8
Other (please describe):	14	7.9	2	6.9	5	4.5	7	18.9
Total N	178	100.0	29	100.0	112	100.0	37	100.0

# Table C21. District-reported high school assessment practices in spring 2020

District Inventory Q42h\_2. What data did your district use to assess how high school students were doing during spring 2020?

	District Type								
	Ove	erall	Alliance	districts	Non-Allia	nce districts	APSEPs		
	Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	
Their attendance in class	152	91.0	25	89.3	88	92.6	39	88.6	
Their completed classroom tasks or assignments	156	93.4	26	92.9	93	97.9	37	84.1	
Their responses to a student survey (excluding social and emotional	72	43.1	14	50.0	49	51.6	9	20.5	
assessments)									
Their performance on a social and emotional assessment	34	20.4	5	17.9	17	17.9	12	27.3	
Their performance on classroom quizzes or tests	126	75.4	21	75.0	78	82.1	27	61.4	
Diagnostic or benchmark schoolwide assessments in English language arts	63	37.7	11	39.3	36	37.9	16	36.4	
Diagnostic or benchmark schoolwide assessments in mathematics	62	37.1	11	39.3	35	36.8	16	36.4	
Other (please describe):	11	6.6	1	3.6	3	3.2	7	15.9	
Total N	167	100.0	28	100.0	95	100.0	44	100.0	

# Table C22. District-reported elementary school assessment practices in 2020-21

District Inventory Q42e 3. What data did your district use to assess how elementary students were doing during school year 2020-21?

	District Type								
	01	verall	Alliance	districts	Non-A	Alliance	APS	SEPs	
					dis	tricts			
	Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	
Their attendance in class	182	95.3	33	100.0	120	95.2	29	90.6	
Their completed classroom tasks or assignments	180	94.2	31	93.9	122	96.8	27	84.4	
Their responses to a student survey (excluding social and emotional	96	50.3	16	48.5	70	55.6	10	31.3	
assessments)									
Their performance on a social and emotional assessment	79	41.4	17	51.5	47	37.3	15	46.9	
Their performance on classroom quizzes or tests	168	88.0	29	87.9	118	93.7	21	65.6	
Diagnostic or benchmark schoolwide assessments in English language arts	167	87.4	31	93.9	114	90.5	22	68.8	
Diagnostic or benchmark schoolwide assessments in mathematics	167	87.4	31	93.9	115	91.3	21	65.6	
Other (please describe):	19	9.9	5	15.2	8	6.3	6	18.8	
Overall	191	100.0	33	100.0	126	100.0	32	100.0	

# Table C23. District-reported middle school assessment practices in 2020-21

District Inventory Q42m 3. What data did your district use to assess how middle school students were doing during 2020-21?

	District Type								
	Ov	erall	Alliance	e districts	Non-A	Alliance	APS	SEPs	
					dis	tricts			
	Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	
Their attendance in class	179	97.3	29	93.5	115	99.1	35	94.6	
Their completed classroom tasks or assignments	175	95.1	28	90.3	114	98.3	33	89.2	
Their responses to a student survey (excluding social and emotional	93	50.5	19	61.3	62	53.4	12	32.4	
assessments)									
Their performance on a social and emotional assessment	72	39.1	13	41.9	42	36.2	17	45.9	
Their performance on classroom quizzes or tests	167	90.8	28	90.3	112	96.6	27	73.0	
Diagnostic or benchmark schoolwide assessments in English language arts	148	80.4	29	93.5	95	81.9	24	64.9	
Diagnostic or benchmark schoolwide assessments in mathematics	147	79.9	29	93.5	94	81.0	24	64.9	
Other (please describe):	17	9.2	4	12.9	6	5.2	7	18.9	
Overall	184	100.0	31	100.0	116	100.0	37	100.0	

	District Type								
	Ov	erall	Alliance	districts	Non-A	lliance	APS	EPs	
					dist	tricts			
	Valid Valid		Valid	Valid	Valid	Valid	Valid	Valid	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	
Their attendance in class	169	97.1	30	96.8	96	97.0	43	97.7	
Their completed classroom tasks or assignments	161	92.5	29	93.5	95	96.0	37	84.1	
Their responses to a student survey (excluding social and emotional	93	53.4	21	67.7	60	60.6	12	27.3	
assessments)									
Their performance on a social and emotional assessment	63	36.2	11	35.5	37	37.4	15	34.1	
Their performance on classroom quizzes or tests	152	87.4	28	90.3	94	94.9	30	68.2	
Diagnostic or benchmark schoolwide assessments in English language arts	127	73.0	28	90.3	76	76.8	23	52.3	
Diagnostic or benchmark schoolwide assessments in mathematics	126	72.4	28	90.3	75	75.8	23	52.3	
Other (please describe):	16	9.2	4	12.9	4	4.0	8	18.2	
Overall	174	100.0	31	100.0	99	100.0	44	100.0	

Table C24. District-reported high school assessment practices in 2020-21District Inventory Q42h\_3. What data did your district use to assess how high school students were doing during 2020-21?

# Table C25. Teacher-reported elementary school assessment practices in 2020-21

Teacher Survey Q26. What information was available to you during the 2020-21 school year to assess how your students were doing? Please select all that apply. (Elementary teachers)

				Distric	t Type	
	Ov	erall	Alliance	e districts	Non-Allia	nce districts
	Valid	Valid	Valid	Valid	Valid	Valid
	Count	Percent	Count	Percent	Count	Percent
Their participation in class	803	92.7	331	89.9	472	94.8
Their work on assignments or exit tickets in my class	753	87.0	313	85.1	440	88.4
Their responses to a student survey (excluding social- emotional assessments)	283	32.7	106	28.8	177	35.5
Their performance on a social and emotional assessment	193	22.3	77	20.9	116	23.3
Their performance on classroom quizzes or tests	597	68.9	247	67.1	350	70.3
Their scores on diagnostic or benchmark schoolwide assessments in English language arts	561	64.8	239	64.9	322	64.7
Their scores on diagnostic or benchmark schoolwide assessments in mathematics	544	62.8	231	62.8	313	62.9
Their attendance	790	91.2	345	93.8	445	89.4
Input/communication from parents	585	67.6	236	64.1	349	70.1
Other (please describe):	31	3.6	13	3.5	18	3.6
Total N	866	100.0	368	100.0	498	100.0

# Table C26. Teacher-reported middle school assessment practices in 2020-21

Teacher Survey Q26. What information was available to you during the 2020-21 school year to assess how your students were doing? Please select all that apply. (Middle school teachers)

				Distric	t Type	
	Ove	erall	Alliance of	listricts	Non-Alliand	e districts
	Valid	Valid	Valid	Valid	Valid	Valid
	Count	Percent	Count	Percent	Count	Percent
Their participation in class	473	91.5	155	95.1	318	89.8
Their work on assignments or exit tickets in my class	483	93.4	151	92.6	332	93.8
Their responses to a student survey (excluding social- emotional assessments)	292	56.5	88	54.0	204	57.6
Their performance on a social and emotional assessment	150	29.0	53	32.5	97	27.4
Their performance on classroom quizzes or tests	455	88.0	141	86.5	314	88.7
Their scores on diagnostic or benchmark schoolwide assessments in English language arts	273	52.8	79	48.5	194	54.8
Their scores on diagnostic or benchmark schoolwide assessments in mathematics	239	46.2	70	42.9	169	47.7
Their attendance	476	92.1	153	93.9	323	91.2
Input/communication from parents	333	64.4	105	64.4	228	64.4
Other (please describe):	25	4.8	10	6.1	15	4.2
Total N	517	100.0	163	100.0	354	100.0

# Table C27. Teacher-reported high school assessment practices in 2020-21

Teacher Survey Q26. What information was available to you during the 2020-21 school year to assess how your students were doing? Please select all that apply. (High school teachers)

				Distric	et Type	
	Ov	rerall	Allianc	e districts	Non-Allia	nce districts
	Valid	Valid	Valid	Valid	Valid	Valid
	Count	Percent	Count	Percent	Count	Percent
Their participation in class	694	86.9	212	86.9	482	86.8
Their work on assignments or exit tickets in my class	721	90.2	215	88.1	506	91.2
Their responses to a student survey (excluding social-	444	55.6	132	54.1	312	56.2
emotional assessments)						
Their performance on a social and emotional assessment	175	21.9	58	23.8	117	21.1
Their performance on classroom quizzes or tests	695	87.0	201	82.4	494	89.0
Their scores on diagnostic or benchmark schoolwide	182	22.8	59	24.2	123	22.2
assessments in English language arts						
Their scores on diagnostic or benchmark schoolwide	158	19.8	48	19.7	110	19.8
assessments in mathematics						
Their attendance	738	92.4	223	91.4	515	92.8
Input/communication from parents	438	54.8	123	50.4	315	56.8
Other (please describe):	43	5.4	19	7.8	24	4.3
Total N	799	100.0	244	100.0	555	100.0

### Table C28. Teacher-reported assessment practices in 2020-21 (mixed-level)

Teacher Survey Q26. What information was available to you during the 2020-21 school year to assess how your students were doing? Please select all that apply. (Teachers who selected multiple levels, no levels, or "ungraded")

				Distric	et Type	
	Ov	erall	Alliance	e districts	Non-Allia	nce districts
	Valid	Valid	Valid	Valid	Valid	Valid
	Count	Percent	Count	Percent	Count	Percent
Their participation in class	264	89.2	92	92.0	172	87.8
Their work on assignments or exit tickets in my class	254	85.8	82	82.0	172	87.8
Their responses to a student survey (excluding social-	128	43.2	35	35.0	93	47.4
emotional assessments)						
Their performance on a social and emotional assessment	76	25.7	27	27.0	49	25.0
Their performance on classroom quizzes or tests	233	78.7	75	75.0	158	80.6
Their scores on diagnostic or benchmark schoolwide assessments in English language arts	120	40.5	39	39.0	81	41.3
Their scores on diagnostic or benchmark schoolwide	115	38.9	36	36.0	79	40.3
assessments in mathematics						
Their attendance	267	90.2	91	91.0	176	89.8
Input/communication from parents	181	61.1	52	52.0	129	65.8
Other (please describe):	8	2.7	3	3.0	5	2.6
Total N	296	100.0	100	100.0	196	100.0

Of the approximately 100 teachers who used the "other" open-text option to describe other information available to them during the 2020-21 school year to assess how their students were doing, the most-reported information source was the students themselves. Students were communicating their concerns digitally with their teachers through email, Google classroom chats, text messages, and Microsoft Teams. Furthermore, many teachers ensured that they had individual conversations (check-ins, advisory sessions, one-on-one conversations, etc.) with their students both in person and over Zoom to assess students' needs informally and allow for individual connection. Teachers also obtained information about how their students were doing indirectly. For example, some teachers observed the way students expressed themselves in their artwork or writing (i.e., journal entries), as well as their behavior and demeanor while engaging in lessons or interacting with their peers. Finally, some teachers reported that communication with other staff (via team meetings, SRBI meeting, IEPs, online gradebooks, etc.) was an important source of information about how their student were doing.

					Distric	et Type		
	Ov	erall	Alliance	Alliance districts		nce districts	APSEPs	
	Valid	Valid Valid	Valid Valid	Valid	Valid	Valid	Valid	Valid
	Count	Percent	Count	Percent	Count	Percent	Count	Percent
Academic failure	157	92.4	28	93.3	111	93.3	18	85.7
Chronic absenteeism	162	95.3	30	100.0	115	96.6	17	81.0
Emotional/behavioral health issues	131	77.1	22	73.3	91	76.5	18	85.7
School violence	85	50.0	16	53.3	57	47.9	12	57.1
Suicide risk	92	54.1	17	56.7	62	52.1	13	61.9
Total N	170	100.0	30	100.0	119	100.0	21	100.0

#### Table C29. District-reported use of an early warning system for elementary school students prior to COVID-19

District Inventory Q43e\_1. Did your district use an early warning system (i.e., a system based on student-level data) prior to the COVID-19 pandemic to detect elementary students experiencing the following risks?

#### Table C30. District-reported use of an early warning system for elementary school students during spring 2020

District Inventory Q43e\_2. Did your district use an early warning system (i.e., a system based on student-level data) during the spring of 2020 to detect elementary students experiencing the following risks?

					Distri	ct Type		
	Ov	erall	Alliance	Alliance districts		nce districts	APSEPs	
	Valid	Valid Valid	Valid	Valid	Valid	alid Valid	Valid	Valid
	Count	Percent	Count	Percent	Count	Percent	Count	Percent
Academic failure	119	77.3	21	87.5	84	77.1	14	66.7
Chronic absenteeism	134	87.0	22	91.7	94	86.2	18	85.7
Emotional/behavioral health issues	111	72.1	17	70.8	79	72.5	15	71.4
School violence	51	33.1	8	33.3	36	33.0	7	33.3
Suicide risk	69	44.8	12	50.0	46	42.2	11	52.4
Total N	154	100.0	24	100.0	109	100.0	21	100.0

#### Table C31. District-reported use of an early warning system for elementary school students during school year 2020-21

District Inventory Q43e\_3. Did your district use an early warning system (i.e., a system based on student-level data) during the 2020-21 school year to detect elementary students experiencing the following risks?

					Distri	ct Type		
	Ov	erall	Alliance	Alliance districts		nce districts	APSEPs	
	Valid Count	Valid Percent	Valid Count	Valid Percent	Valid Count	Valid Percent	Valid Count	Valid Percent
Academic failure	155	91.7	27	90.0	110	93.2	18	85.7
Chronic absenteeism	159	94.1	30	100.0	112	94.9	17	81.0
Emotional/behavioral health issues	144	85.2	26	86.7	100	84.7	18	85.7
School violence	86	50.9	16	53.3	59	50.0	11	52.4
Suicide risk	98	58.0	17	56.7	68	57.6	13	61.9
Overall	169	100.0	30	100.0	118	100.0	21	100.0

### Table C32. District-reported use of an early warning system for middle school students prior to COVID-19

District Inventory Q43m\_1. Did your district use an early warning system (i.e., a system based on student-level data) prior to the COVID-19 pandemic to detect middle school students experiencing the following risks?

					Distri	ct Type		
	Ov	erall	Alliance	Alliance districts		Non-Alliance districts		SEPs
	Valid	Valid Valid	lid Valid	Valid	Valid	Valid	Valid	Valid
	Count	Percent	Count	Percent	Count	Percent	Count	Percent
Academic failure	144	93.5	27	96.4	99	94.3	18	85.7
Chronic absenteeism	149	96.8	28	100.0	104	99.0	17	81.0
Emotional/behavioral health issues	118	76.6	18	64.3	82	78.1	18	85.7
School violence	82	53.2	17	60.7	53	50.5	12	57.1
Suicide risk	91	59.1	18	64.3	60	57.1	13	61.9
Total N	154	100.0	28	100.0	105	100.0	21	100.0

					Distri	ct Type		
	Ov	erall	Alliance	Alliance districts		Non-Alliance districts		SEPs
	Valid	Valid Valid	Valid Valid Valid	Valid	Valid	Valid	Valid	Valid
	Count	Percent	Count	Percent	Count	Percent	Count	Percent
Academic failure	111	77.1	21	84.0	76	77.6	14	66.7
Chronic absenteeism	126	87.5	22	88.0	86	87.8	18	85.7
Emotional/behavioral health issues	103	71.5	17	68.0	71	72.4	15	71.4
School violence	50	34.7	8	32.0	35	35.7	7	33.3
Suicide risk	71	49.3	13	52.0	47	48.0	11	52.4
Total N	144	100.0	25	100.0	98	100.0	21	100.0

#### Table C33. District-reported use of an early warning system for middle school students during spring 2020

District Inventory Q43m\_2. Did your district use an early warning system (i.e., a system based on student-level data) during the spring of 2020 to detect middle school students experiencing the following risks?

# Table C34. District-reported use of an early warning system for middle school students during school year 2020-21

District Inventory Q43m\_3. Did your district use an early warning system (i.e., a system based on student-level data) during the 2020-21 school year to detect middle school students experiencing the following risks?

					Distrie	et Type		
	Ov	erall	Alliance	Alliance districts		nce districts	APSEPs	
	Valid	Valid Valid	Valid	Valid	Valid	Valid Valid	Valid	Valid
	Count	Percent	Count	Percent	Count	Percent	Count	Percent
Academic failure	142	92.2	26	92.9	98	93.3	18	85.7
Chronic absenteeism	146	94.8	28	100.0	101	96.2	17	81.0
Emotional/behavioral health issues	129	83.8	22	78.6	89	84.8	18	85.7
School violence	82	53.2	16	57.1	55	52.4	11	52.4
Suicide risk	98	63.6	19	67.9	66	62.9	13	61.9
Overall	154	100.0	28	100.0	105	100.0	21	100.0

# Table C35. District-reported use of an early warning system for high school students prior to COVID-19

District Inventory Q43h\_1. Did your district use an early warning system (i.e., a system based on student-level data) prior to the COVID-19 pandemic to detect high school students experiencing the following risks?

					Distric	et Type		
	Ov	erall	Alliance	Alliance districts		nce districts	APSEPs	
	Valid Count	Valid Percent	Valid Count	Valid Percent	Valid Count	Valid Percent	Valid Count	Valid Percent
Academic failure	148	93.1	28	93.3	90	95.7	30	85.7
Chronic absenteeism	152	95.6	30	100.0	93	98.9	29	82.9
Emotional/behavioral health issues	119	74.8	20	66.7	70	74.5	29	82.9
School violence	87	54.7	17	56.7	53	56.4	17	48.6
Suicide risk	103	64.8	17	56.7	65	69.1	21	60.0
Total N	159	100.0	30	100.0	94	100.0	35	100.0

# Table C36. District-reported use of an early warning system for high school students during spring 2020

District Inventory Q43h\_2. Did your district use an early warning system (i.e., a system based on student-level data) during the spring of 2020 to detect high school students experiencing the following risks?

					Distrie	et Type		
	Ov	erall	Alliance	Alliance districts		nce districts	APSEPs	
	Valid	Valid Valid V	Valid	Valid Valid	Valid	Valid	Valid	Valid
	Count	Percent	Count	Percent	Count	Percent	Count	Percent
Academic failure	132	88.6	21	80.8	83	93.3	28	82.4
Chronic absenteeism	132	88.6	23	88.5	81	91.0	28	82.4
Emotional/behavioral health issues	115	77.2	20	76.9	66	74.2	29	85.3
School violence	57	38.3	10	38.5	36	40.4	11	32.4
Suicide risk	91	61.1	15	57.7	57	64.0	19	55.9
Total N	149	100.0	26	100.0	89	100.0	34	100.0

# Table C37. District-reported use of an early warning system for high school students during school year 2020-21

District Inventory Q43h\_3. Did your district use an early warning system (i.e., a system based on student-level data) during the 2020-21 school year to detect high school students experiencing the following risks?

					Distric	et Type		
	Ov	erall	Alliance	Alliance districts		Non-Alliance districts		SEPs
	Valid Count	Valid Percent	Valid Count	Valid Percent	Valid Count	Valid Percent	Valid Count	Valid Percent
Academic failure	147	92.5	27	90.0	89	94.7	31	88.6
Chronic absenteeism	149	93.7	30	100.0	90	95.7	29	82.9
Emotional/behavioral health issues	130	81.8	23	76.7	77	81.9	30	85.7
School violence	91	57.2	20	66.7	55	58.5	16	45.7
Suicide risk	112	70.4	20	66.7	71	75.5	21	60.0
Overall	159	100.0	30	100.0	94	100.0	35	100.0

# Table C38. District-reported elementary school grading practices prior to the COVID-19 pandemic

					Distri	et Type		
	Ov	erall	Alliance districts		Non-Alliance districts		APSEPs	
	Valid Count	Valid Percent	Valid Count	Valid Percent	Valid Count	Valid Percent	Valid Count	Valid Percent
Pass/fail	22	11.8	5	16.1	14	11.1	3	10.3
Proficiency	159	85.5	27	87.1	113	89.7	19	65.5
Letter grades	69	37.1	14	45.2	39	31.0	16	55.2
Grading was suspended	4	2.2	0	.0	3	2.4	1	3.4
Other (please describe):	11	5.9	2	6.5	5	4.0	4	13.8
Total N	186	100.0	31	100.0	126	100.0	29	100.0

District Inventory Q44e 1. On what basis did your elementary teachers report students' progress prior to COVID-19?

# Table C39. District-reported elementary school grading practices in spring 2020

District Inventory Q44e\_2. On what basis did your elementary teachers report students' progress during the spring of 2020?

					Distric	t Type		
	Ov	Overall		Alliance districts		Non-Alliance districts		SEPs
	Valid Count	Valid Percent	Valid Count	Valid Percent	Valid Count	Valid Percent	Valid Count	Valid Percent
Pass/fail	60	32.6	17	53.1	36	29.3	7	24.1
Proficiency	85	46.2	11	34.4	58	47.2	16	55.2
Letter grades	34	18.5	5	15.6	19	15.4	10	34.5
Grading was suspended	58	31.5	9	28.1	45	36.6	4	13.8
Other (please describe):	20	10.9	6	18.8	9	7.3	5	17.2
Total N	184	100.0	32	100.0	123	100.0	29	100.0

# Table C40. District-reported elementary school grading practices in school year 2020-21

District Inventory Q44e\_3. On what basis did your elementary teachers report students' progress during 2020-21?

					Distrie	et Type		
	Overall		Alliance districts		Non-Alliance districts		APSEPs	
	Valid Count	Valid Percent	Valid Count	Valid Percent	Valid Count	Valid Percent	Valid Count	Valid Percent
Pass/fail	19	10.3	5	15.6	11	8.9	3	10.3
Proficiency	159	85.9	27	84.4	113	91.1	19	65.5
Letter grades	67	36.2	14	43.8	37	29.8	16	55.2
Grading was suspended	4	2.2	0	.0	4	3.2	0	.0
Other (please describe):	13	7.0	3	9.4	5	4.0	5	17.2
Overall	185	100.0	32	100.0	124	100.0	29	100.0

# Table C41. District-reported middle school grading practices prior to the COVID-19 pandemic

					Distri	et Type		
	Ov	erall	Alliance districts		Non-Alliance districts		APSEPs	
	Valid Count	Valid Percent	Valid Count	Valid Percent	Valid Count	Valid Percent	Valid Count	Valid Percent
Pass/fail	34	19.3	7	25.9	21	18.4	6	17.1
Proficiency	81	46.0	13	48.1	49	43.0	19	54.3
Letter grades	138	78.4	25	92.6	89	78.1	24	68.6
Grading was suspended	3	1.7	0	.0	2	1.8	1	2.9
Other (please describe):	9	5.1	1	3.7	3	2.6	5	14.3
Total N	176	100.0	27	100.0	114	100.0	35	100.0

District Inventory Q44m\_1. On what basis did your middle school teachers report students' progress prior to COVID-19?

# Table C42. District-reported middle school grading practices in spring 2020

District Inventory Q44m\_2. On what basis did your middle school teachers report students' progress during the spring of 2020?

					Distric	t Type			
	Ov	Overall		Alliance districts		Non-Alliance districts		APSEPs	
	Valid Count	Valid Percent	Valid Count	Valid Percent	Valid Count	Valid Percent	Valid Count	Valid Percent	
Pass/fail	91	51.1	21	72.4	61	53.0	9	26.5	
Proficiency	54	30.3	9	31.0	28	24.3	17	50.0	
Letter grades	78	43.8	16	55.2	46	40.0	16	47.1	
Grading was suspended	36	20.2	0	.0	31	27.0	5	14.7	
Other (please describe):	16	9.0	2	6.9	7	6.1	7	20.6	
Total N	178	100.0	29	100.0	115	100.0	34	100.0	

# Table C43. District-reported middle school grading practices in school year 2020-21

District Inventory Q44m\_3. On what basis did your middle school teachers report students' progress during 2020-21?

					Distric	t Type		
	Overall		Alliance districts		Non-Alliance districts		APSEPs	
	Valid Count	Valid Percent	Valid Count	Valid Percent	Valid Count	Valid Percent	Valid Count	Valid Percent
Pass/fail	38	21.1	9	30.0	24	20.9	5	14.3
Proficiency	83	46.1	13	43.3	50	43.5	20	57.1
Letter grades	142	78.9	26	86.7	90	78.3	26	74.3
Grading was suspended	6	3.3	0	.0	6	5.2	0	.0
Other (please describe):	11	6.1	2	6.7	3	2.6	6	17.1
Overall	180	100.0	30	100.0	115	100.0	35	100.0

# Table C44. District-reported high school grading practices prior to the COVID-19 pandemic

					Distri	et Type		
	Ov	erall	Alliance districts		Non-Alliance districts		APSEPs	
	Valid Count	Valid Percent	Valid Count	Valid Percent	Valid Count	Valid Percent	Valid Count	Valid Percent
Pass/fail	37	22.3	7	25.0	20	20.6	10	24.4
Proficiency	50	30.1	12	42.9	21	21.6	17	41.5
Letter grades	149	89.8	26	92.9	93	95.9	30	73.2
Grading was suspended	3	1.8	0	.0	2	2.1	1	2.4
Other (please describe):	10	6.0	1	3.6	4	4.1	5	12.2
Total N	166	100.0	28	100.0	97	100.0	41	100.0

District Inventory Q44h\_1. On what basis did your high school teachers report students' progress prior to COVID-19?

# Table C45. District-reported high school grading practices in spring 2020

District Inventory Q44h\_2. On what basis did your high school teachers report students' progress during the spring of 2020?

					Distrie	et Type		
	Overall		Alliance districts		Non-Alliance districts		APSEPs	
	Valid Count	Valid Percent	Valid Count	Valid Percent	Valid Count	Valid Percent	Valid Count	Valid Percent
Pass/fail	102	60.4	25	80.6	60	61.2	17	42.5
Proficiency	43	25.4	8	25.8	17	17.3	18	45.0
Letter grades	91	53.8	15	48.4	56	57.1	20	50.0
Grading was suspended	21	12.4	1	3.2	17	17.3	3	7.5
Other (please describe):	14	8.3	2	6.5	6	6.1	6	15.0
Total N	169	100.0	31	100.0	98	100.0	40	100.0

# Table C46. District-reported high school grading practices in school year 2020-21

District Inventory 44h 3. On what basis did your high school teachers report students' progress during 2020-21?

					Distrie	et Type		
	Overall		Alliance districts		Non-Alliance districts		APSEPs	
	Valid Count	Valid Percent	Valid Count	Valid Percent	Valid Count	Valid Percent	Valid Count	Valid Percent
Pass/fail	46	27.1	12	38.7	26	26.5	8	19.5
Proficiency	55	32.4	12	38.7	23	23.5	20	48.8
Letter grades	156	91.8	27	87.1	95	96.9	34	82.9
Grading was suspended	4	2.4	0	.0	4	4.1	0	.0
Other (please describe):	11	6.5	2	6.5	4	4.1	5	12.2
Overall	170	100.0	31	100.0	98	100.0	41	100.0

# Research Question 1c. What did administrators and teachers say about the challenges of and strategies for different learning formats?

# Table C47. District-reported student disengagement by grade level in May 2020

District Inventory Q27. As of May 1, 2020, approximately what percentage of students were accessing remote learning less than half the time for the following grade levels?

		District Type												
	Overall			Alliance districts			Non-Alliance districts			APSEPs				
	Mean			Mean			Mean			Mean				
	Ν	Percent	(SD)	N	Percent	(SD)	Ν	Percent	(SD)	Ν	Percent	(SD)		
Elementary School	181	32.0	(29.0)	31	29.5	(23.0)	121	29.7	(30.2)	29	44.1	(27.2)		
Middle School	179	34.7	(29.8)	31	36.8	(24.2)	115	31.5	(31.2)	33	44.2	(28.1)		
High School	165	36.3	(29.3)	31	40.8	(24.2)	93	32.6	(30.2)	41	41.5	(30.2)		

Please note, mean percent describes the mean of each participating district's reported value.
#### Table C48. District-reported reasons by grade level for student disengagement in May 2020

District Inventory Q28. As of May 1, 2020, of students accessing remote learning less than half the time, what were the most common reasons given for the following grade levels?

								District Type	e			
		Overall		A	Alliance dist	ricts		Non-Allianco	e districts		APSEPs	
		Mean			Mean			Mean			Mean	
	Ν	Ranking	(SD)	N	Ranking	(SD)	Ν	Ranking	(SD)	Ν	Ranking	(SD)
Elementary School												
No/limited WiFi	152	2.7	(1.3)	30	2.2	(1.2)	102	2.9	(1.4)	20	2.4	(1.3)
No technology device	152	3.4	(1.2)	30	3.4	(1.4)	102	3.6	(1.2)	20	2.7	(1.0)
(laptop, Chromebook, iPad)												
Hardware issues (camera, mic, etc.)	152	2.8	(1.0)	30	2.9	(1.0)	102	2.7	(.9)	20	3.1	(1.0)
Incomplete/incorrect	152	3.7	(1.2)	30	3.6	(1.1)	102	3.6	(1.2)	20	4.0	(1.1)
instructions												
Other (please describe):	152	2.5	(1.8)	30	2.9	(1.9)	102	2.2	(1.8)	20	2.9	(2.0)
Middle School												
No/limited WiFi	149	2.8	(1.3)	27	2.8	(1.2)	98	2.9	(1.3)	24	2.5	(1.2)
No technology device	149	3.4	(1.2)	27	3.6	(1.3)	98	3.5	(1.2)	24	3.1	(1.2)
(laptop, Chromebook, iPad)												
Hardware issues (camera, mic, etc.)	149	2.8	(1.0)	27	2.8	(1.0)	98	2.7	(1.0)	24	3.0	(1.0)
Incomplete/incorrect	149	3.8	(1.1)	27	3.6	(1.1)	98	3.7	(1.1)	24	3.9	(1.2)
instructions												
Other (please describe):	149	2.2	(1.8)	27	2.2	(1.8)	98	2.1	(1.7)	24	2.4	(1.9)
High School												
No/limited WiFi	146	2.7	(1.3)	28	2.8	(1.3)	84	2.8	(1.3)	34	2.3	(1.3)
No technology device	146	3.5	(1.2)	28	3.5	(1.2)	84	3.7	(1.2)	34	3.2	(1.1)
(laptop, Chromebook, iPad)												
Hardware issues (camera, mic, etc.)	146	2.9	(1.0)	28	2.9	(1.0)	84	2.8	(1.0)	34	3.0	(1.1)
Incomplete/incorrect	146	3.7	(1.1)	28	3.7	(1.1)	84	3.6	(1.1)	34	4.0	(1.0)
instructions												
Other (please describe):	146	2.2	(1.8)	28	2.2	(1.8)	84	2.1	(1.7)	34	2.5	(1.8)

Please note, districts were asked to rank order the options listed above, with the highest ranked option receiving a score of 1 and the lowest ranked option receiving a score of 5.

Districts listed many other reasons why students were accessing remote learning less than half the time in May 2020. For elementary students, the primary reason (beyond the multiple-choice options offered) was inadequate parental support and/or supervision available; this was an issue reported by 76 districts. In many cases, parents were busy (working, taking care of other children, etc.) and couldn't supervise their children's online learning to ensure attendance and participation. In other cases, students were in some form of daycare or with other guardians, such as grandparents. As a result, these students weren't accessing remote instruction because their

caregiver didn't have the technology expertise to help them or weren't able to supervise their learning. A few districts reported that parents didn't want their children to participate in online learning and didn't cooperate for that reason.

The other factor most frequently reported by districts was that elementary students were simply disengaged from remote learning and unmotivated to participate. Districts reported that it was difficult for students to focus on remote instruction, and the short attention span of elementary students meant that many students needed substantial parent/caregiver support to engage with online learning. There were also some students who struggled to engage with remote learning because they had special needs and/or learning disabilities and were not receiving the necessary support to learn virtually. Finally, two districts reported disengagement due to language barriers between the school and the family.

For middle school students who were not accessing remote learning in the spring of 2020, the most common reason given by districts that elected to provide an additional answer was inadequate support/supervision from parents/caregivers to ensure that students were attending and participating virtually. As for elementary students, districts reported that some parents/caregivers were unable to monitor their middle school students' engagement with remote learning because they were busy taking care of other children. Some districts mentioned that some middle school students themselves were taking care of younger siblings and thus were unable to attend school at times. A general disengagement and lack of motivation among students was reported in conjunction with the lack of parent/caregiver support to keep students on track.

For high school students, student disengagement and lack of motivation were the primary reason beyond the multiple-choice options that districts said students were failing to access remote learning in the spring of 2020. Many districts reported that students refused to attend remote instruction or disengaged for a multitude of reasons. These include mental health problems, as some districts reported increases in student anxiety and depression, lack of motivation to engage with the new learning format, and social-emotional issues. This was compounded by inadequate parent/caregiver discipline or support to ensure that students were attending and participating in virtual schooling. An additional reason given for high school students not accessing online learning was a lack of housing stability. Furthermore, many high school students had to take on additional familial and/or job responsibilities when the pandemic began. Districts reported that high school students were employed and were working instead of attending school; some districts specifically noted that their high school students were working to provide additional income for their families. High school students also often acted as secondary caregivers and were disengaged from online learning because they were taking care of their younger siblings. Thus, there were a plethora of reasons that districts reported for the apathy and disengagement of high school students at the beginning of the pandemic.

#### Table C49. Teacher-reported rates of student disengagement by grade level in spring 2020

Teacher Survey Q7f and Q7g. When students were learning remotely during spring 2020 (start of COVID-pandemic), approximately what percent of your students were doing each of the following?

		District Type								
			Overall		Al	liance distri	icts	Non-	Alliance dis	stricts
		Mean				Mean				
		Ν	Percent	(SD)	Ν	Percent	(SD)	Ν	Percent	(SD)
Elementary	logging into remote instruction less than half the time	910	39.7	(26.8)	368	46.9	(26.9)	542	34.8	(25.5)
school	showing some evidence of digital cheating	831	11.4	(19.5)	333	13.9	(21.4)	498	9.8	(18.0)
Middle	logging into remote instruction less than half the time	538	39.3	(25.8)	169	42.8	(27.8)	369	37.7	(24.7)
school	showing some evidence of digital cheating	520	26.0	(25.5)	162	26.6	(26.5)	358	25.8	(25.1)
High school	logging into remote instruction less than half the time	833	42.8	(28.4)	255	46.9	(28.0)	578	41.0	(28.4)
	showing some evidence of digital cheating	825	38.6	(30.5)	252	34.0	(29.9)	573	40.6	(30.6)
Multiple	logging into remote instruction less than half the time	305	43.8	(28.3)	99	47.3	(28.1)	206	42.1	(28.4)
levels,	showing some evidence of digital cheating	283	19.4	(25.4)	94	16.8	(22.2)	189	20.7	(26.8)
ungraded,										
or unknown										

Please note, mean percent describes the mean of each participating teacher's reported value.

#### Table C50. Teacher-reported reasons for student disengagement by grade level in spring 2020

Teacher Survey Q8. For those of your students who were unable to access remote learning at least half the time in spring 2020, what do you think were the most common reasons?

							Distric	t Type		
			Overall		A	Alliance distric	ts	Nor	n-Alliance dist	ricts
			Mean			Mean			Mean	
		Ν	Ranking	(SD)	N	Ranking	(SD)	Ν	Ranking	(SD)
Elementary school	no/limited wifi	853	3.1	(1.6)	355	2.7	(1.5)	498	3.3	(1.6)
	no technology device	853	4.6	(1.7)	355	4.2	(1.8)	498	4.8	(1.6)
	hardware issues	853	4.0	(1.3)	355	4.1	(1.3)	498	3.8	(1.3)
	incomplete/incorrect connection instructions	853	4.7	(1.3)	355	4.8	(1.3)	498	4.6	(1.3)
	inadequate adult supervision	853	1.9	(1.3)	355	2.1	(1.4)	498	1.8	(1.3)
	other family responsibilities	853	3.8	(1.8)	355	3.9	(1.8)	498	3.7	(1.8)
	other reasons	853	6.1	(1.9)	355	6.1	(1.9)	498	6.1	(1.9)
Middle school	no/limited wifi	514	3.1	(1.6)	163	2.5	(1.5)	351	3.4	(1.6)
	no technology device	514	4.9	(1.6)	163	4.3	(1.8)	351	5.1	(1.5)
	hardware issues	514	4.2	(1.3)	163	4.4	(1.2)	351	4.1	(1.3)
	incomplete/incorrect connection instructions	514	4.9	(1.3)	163	5.0	(1.3)	351	4.8	(1.3)
	inadequate adult supervision	514	1.9	(1.3)	163	2.4	(1.6)	351	1.7	(1.2)
	other family responsibilities	514	3.2	(1.6)	163	3.3	(1.6)	351	3.1	(1.5)
	other reasons	514	5.8	(2.1)	163	6.2	(1.7)	351	5.7	(2.3)
High school	no/limited wifi	771	3.1	(1.7)	244	2.6	(1.5)	527	3.3	(1.7)
	no technology device	771	4.6	(1.7)	244	4.3	(1.7)	527	4.8	(1.7)
	hardware issues	771	4.2	(1.3)	244	4.4	(1.3)	527	4.1	(1.4)
	incomplete/incorrect connection instructions	771	5.1	(1.2)	244	5.1	(1.3)	527	5.1	(1.2)
	inadequate adult supervision	771	2.6	(1.7)	244	2.9	(1.8)	527	2.4	(1.6)
	other family responsibilities	771	2.9	(1.5)	244	2.7	(1.5)	527	3.0	(1.5)
	other reasons	771	5.5	(2.4)	244	5.9	(2.1)	527	5.3	(2.5)
Multiple levels,	no/limited wifi	290	3.2	(1.7)	95	2.7	(1.6)	195	3.4	(1.7)
ungraded, or unknown	no technology device	290	4.6	(1.7)	95	4.0	(1.8)	195	4.9	(1.6)
	hardware issues	290	4.0	(1.3)	95	4.3	(1.2)	195	3.9	(1.3)
	incomplete/incorrect connection instructions	290	4.9	(1.3)	95	5.0	(1.3)	195	4.9	(1.4)
	inadequate adult supervision	290	2.1	(1.5)	95	2.5	(1.8)	195	1.9	(1.3)
	other family responsibilities	290	3.5	(1.7)	95	3.4	(1.6)	195	3.5	(1.7)
	other reasons	290	5.6	(2.3)	95	6.1	(1.9)	195	5.4	(2.5)

Please note, teachers were asked to rank order the options listed above, with the highest ranked option receiving a score of 1 and the lowest ranked option receiving a score of 7.

#### Table C51. District-reported rates of student disengagement during the 2020-21 school year

District Inventory Q32emh. During the 2020-21 school year, approximately what percentage of fully remote students accessed instruction from home less than half the time?

	_	District Type												
		Overall		I	Alliance distric	ets	Noi	n-Alliance dist	ricts		APSEPs			
		Mean			Mean			Mean			Mean	Mean		
	Ν	Percent	(SD)	N	Percent	(SD)	Ν	Percent	(SD)	Ν	Percent	(SD)		
Elementary	158	20.2	(18.7)	30	22.5	(15.0)	104	17.4	(18.0)	24	29.6	(22.6)		
School														
Middle School	160	23.3	(20.2)	28	27.7	(18.9)	103	19.3	(16.4)	29	33.1	(28.3)		
High School	155	24.9	(21.4)	31	30.8	(21.7)	85	21.2	(16.6)	39	28.5	(28.2)		

Please note, mean percentage describes the mean of each participating district's reported value.

#### Table C52. District-reported reasons by grade level for student disengagement during 2020-21

District Inventory Q33emh. For those fully remote students who did not consistently access instruction from home during the 2020-21 school year, what were the most common reasons given for each of the following grade levels?

								District Typ	e			
		Overall			Alliance distr	ricts	Ν	on-Alliance dis	stricts		APSEPs	
		Mean			Mean			Mean			Mean	
	Ν	Ranking	(SD)	N	Ranking	(SD)	Ν	Ranking	(SD)	Ν	Ranking	(SD)
Elementary												
No/limited WiFi	146	2.8	(1.4)	29	2.8	(1.3)	99	2.8	(1.4)	18	2.3	(1.3)
No technology device	146	3.6	(1.2)	29	4.0	(.9)	99	3.6	(1.2)	18	2.8	(1.0)
(laptop, Chromebook, iPad)												
Hardware issues	146	2.8	(1.0)	29	2.8	(1.2)	99	2.7	(1.0)	18	3.2	(1.1)
(camera, mic, etc.)												
Incomplete/incorrect	146	3.5	(1.1)	29	3.1	(1.2)	99	3.6	(1.1)	18	3.9	(1.1)
instructions	1.4.6		(1.0)		<u> </u>	(1.0)			(1.0)	10	•	
Other (please describe):	146	2.3	(1.8)	29	2.4	(1.8)	99	2.2	(1.8)	18	2.8	(2.0)
Middle School						(1.0)	~-					<i>(</i> <b>4 4</b> )
No/limited WiFi	149	2.7	(1.2)	28	2.7	(1.0)	97	2.7	(1.3)	24	2.4	(1.1)
No technology device	149	3.6	(1.1)	28	3.9	(1.0)	97	3.6	(1.2)	24	3.3	(1.1)
(laptop, Chromebook,												
1Pad)	1.40	2.0	(1,0)	20	2.7	(1, 2)	07	2.0	(1,0)	24	2.1	(1,0)
Hardware issues	149	2.8	(1.0)	28	2.7	(1.3)	97	2.8	(1.0)	24	3.1	(1.0)
(camera, mic, etc.)	140	2 8	$(1 \ 1)$	20	2.5	$(1 \ 2)$	07	2 9	$(1 \ 1)$	24	4.0	$(1 \ 1)$
instructions	149	5.8	(1.1)	20	5.5	(1.2)	97	3.0	(1.1)	24	4.0	(1.1)
Other (please describe):	149	2.2	(1.8)	28	2.1	(1.8)	97	21	(1.8)	24	2.2	(1.8)
High School	147	2.2	(1.0)	20	2.1	(1.0)	71	2.1	(1.0)	27	2.2	(1.0)
No/limited WiFi	144	27	(12)	28	2.8	$(1 \ 1)$	84	29	(1 2)	32	23	(1 1)
No technology device	144	3.6	(1.2)	28	3.8	(1.0)	84	3.7	(1.2)	32	3.2	(1.1)
(laptop, Chromebook,			()			()			()			()
iPad)												
Hardware issues	144	2.8	(1.1)	28	2.9	(1.4)	84	2.7	(1.0)	32	3.0	(1.0)
(camera, mic, etc.)			· /			. ,			. ,			
Incomplete/incorrect	144	3.8	(1.1)	28	3.6	(1.2)	84	3.7	(1.2)	32	4.1	(.9)
instructions												
Other (please describe):	144	2.1	(1.8)	28	2.0	(1.7)	84	2.0	(1.7)	32	2.4	(1.9)

Please note, districts were asked to rank order the options listed above, with the highest ranked option receiving a score of 1 and the lowest ranked option receiving a score of 5.

Districts used the "other" open-text option to describe a variety of reasons that students were accessing remote learning less than half the time during the 2020/21 school year. Similar to district responses for spring 2020 (see Table C48 above), districts reported that inadequate parent/caregiver support and supervision was the main factor affecting student disengagement. Again, some districts reported that parents were unavailable to help their elementary students access remote learning or ensure that they were attending because parents were working or taking care of other children and couldn't devote time to managing online learning. A commonly reported issue was that students weren't under the care of their parents but rather grandparents, older siblings, or daycare providers and thus didn't have the support needed to access virtual instruction or materials. Other familial problems that districts reported were housing instability and mental or physical health concerns in the family. Many districts reported that in 2020-21, some elementary students were experiencing behavioral issues, felt disengaged from remote learning, or lacked the motivation and focus to participate in this format. Some districts reported that parents simply refused to cooperate with remote learning, especially because they didn't want their child participating in that amount of online work.

For middle school students who were accessing remote learning less than half of the time in the 2020-21 school year, districts that elected to provide additional reasons beyond the multiple-choice options reported two major reasons for students not accessing remote instruction: insufficient parental supervision/encouragement and disengagement of students from remote learning. Some districts simply mentioned that parents were not providing adequate support or supervision for their students, whereas others elaborated that parents were often working or caring for other children and couldn't devote time to supporting remote learning. The other issue reported was that students were unmotivated to learn in a remote format and thus disengaged from virtual learning altogether.

A number of districts elected to provide other reasons beyond the multiple choice options for why high school students were accessing remote learning less than half of the time during the 2020-21 school year. The primary explanation for high school students not accessing remote instruction was that they were unmotivated and disengaged from this learning format. Many districts reported that their students had experienced mental health issues, such as increases in depression and anxiety, and struggled with social-emotional problems. Districts said that students and their families also reported concerns about their physical health. Familial reasons for students not attending virtual instruction were also prevalent. Some parents elected to not have their students participate in remote learning, or they didn't support/supervise their students and ensure that they were attending. Other students were taking on additional responsibilities to help their families during the pandemic, including providing childcare for their siblings or working a job to provide extra income. Thus, general disengagement was the main reason that students did not attend remote instruction, but parental/familial factors played an influential role in this decision.

#### Table C53. Teacher-reported rates of student disengagement by grade level among fully remote learners in 2020-21

*Teacher Survey Q11f & Q11g. You indicated that some of your students attended school remotely for the majority of 2020-21. Over the 2020-21 school year, approximately what percent of your fully remote students were doing each of the following?* 

							Distric	t Type			
			Overall		А	lliance distri	cts	Non-Alliance dist		stricts	
		Mean				Mean			Mean		
		Ν	Percent	(SD)	N	Percent	(SD)	Ν	Percent	(SD)	
Elementary school	missing school more than half the time	724	25.7	(26.2)	318	31.8	(26.3)	406	21.0	(25.2)	
	showing some evidence of digital cheating	688	12.7	(20.6)	294	15.8	(22.5)	394	10.4	(18.7)	
Middle school	missing school more than half the time	483	31.0	(24.7)	160	33.8	(24.1)	323	29.7	(24.9)	
	showing some evidence of digital cheating	471	26.1	(26.7)	155	25.7	(26.2)	316	26.3	(26.9)	
High school	missing school more than half the time	757	35.0	(24.8)	238	41.2	(23.9)	519	32.2	(24.7)	
	showing some evidence of digital cheating	748	39.6	(31.4)	230	36.1	(29.3)	518	41.1	(32.3)	
Multiple levels,	missing school more than half the time	274	34.0	(26.8)	96	41.8	(26.0)	178	29.8	(26.5)	
ungraded, or unknown	showing some evidence of digital cheating	249	22.0	(27.6)	87	19.2	(23.9)	162	23.5	(29.3)	

Please note, mean percent describes the mean of each participating district's reported value.

### Table C54. Teacher-reported rates of student disengagement by grade level among hybrid learners in 2020-21

Teacher Survey Q12f & Q12g. You indicated that some of your students were hybrid—scheduled to attend school in-person on some days and remotely on other days—for the majority of 2020-21. Over the 2020-21 school year, approximately what percent of your hybrid students were doing each of the following?

		District Type								
			Overall		A	lliance distri	cts	Non-Alliance dis		stricts
			Mean			Mean		Mean		
		Ν	Percent	(SD)	Ν	Percent	(SD)	Ν	Percent	(SD)
Elementary school	missing school more than half the time	577	22.8	(21.6)	269	28.4	(21.9)	308	17.9	(20.2)
	showing some evidence of digital cheating	533	10.9	(18.8)	240	13.6	(21.2)	293	8.6	(16.3)
Middle school	missing school more than half the time	453	26.3	(21.0)	147	29.3	(20.6)	306	24.9	(21.0)
	showing some evidence of digital cheating	446	23.2	(23.3)	144	22.3	(23.7)	302	23.6	(23.2)
High school	missing school more than half the time	733	29.9	(22.4)	218	36.2	(23.9)	515	27.3	(21.2)
	showing some evidence of digital cheating	729	37.4	(29.3)	214	32.6	(27.5)	515	39.4	(29.8)
Multiple levels,	missing school more than half the time	237	31.5	(24.9)	86	35.9	(22.8)	151	29.0	(25.8)
ungraded, or unknown	showing some evidence of digital cheating	221	19.0	(23.8)	81	15.4	(20.5)	140	21.0	(25.4)

Please note, mean percent describes the mean of each participating district's reported value.

#### Table C55. Teacher-reported rates of student disengagement by grade level among fully in-person learners in 2020-21

*TS Q13d and Q13e.* You indicated that some of your students attended school in person for the majority of the 2020-21 school year. *Over the <u>2020-21 school year</u>*, approximately what percent of your fully in-person students were doing each of the following?

		District Type								
			Overall		А	lliance distri	cts	Non-Alliance dis		stricts
			Mean			Mean		Mean		
		Ν	Percent	(SD)	Ν	Percent	(SD)	Ν	Percent	(SD)
Elementary school	missing school more than half the time	643	16.0	(19.1)	237	23.2	(21.5)	406	11.8	(16.2)
	showing some evidence of digital cheating	595	5.6	(12.4)	212	8.0	(15.6)	383	4.3	(10.1)
Middle school	missing school more than half the time	361	18.7	(18.3)	105	23.0	(20.3)	256	16.9	(17.1)
	showing some evidence of digital cheating	352	18.0	(20.9)	104	20.0	(22.7)	248	17.1	(20.1)
High school	missing school more than half the time	498	23.7	(22.1)	144	30.3	(22.8)	354	21.0	(21.3)
	showing some evidence of digital cheating	492	27.5	(27.0)	141	28.7	(26.8)	351	27.0	(27.1)
Multiple levels,	missing school more than half the time	241	25.3	(23.0)	73	32.5	(25.1)	168	22.1	(21.3)
ungraded, or	showing some evidence of digital cheating	221	16.8	(23.0)	69	18.7	(25.1)	152	16.0	(22.0)
unknown										

Please note, mean percent describes the mean of each participating district's reported value.

#### Table C56. Teacher-reported reasons for student disengagement by grade level in 2020-21

Teacher Survey Q14. For your fully remote and/or hybrid students who accessed remote learning less than half the time during the 2020-21 school year, what do you think were the most common reasons?

							Distric	t Type		
			Overall		A	Alliance distric	ts	Nor	n-Alliance dist	ricts
			Mean			Mean			Mean	
		Ν	Ranking	(SD)	N	Ranking	(SD)	Ν	Ranking	(SD)
Elementary school	no/limited Wi-Fi	690	3.2	(1.5)	346	3.2	(1.5)	344	3.3	(1.5)
	no technology device	690	4.9	(1.4)	346	4.8	(1.4)	344	5.0	(1.4)
	hardware issues	690	3.7	(1.3)	346	3.8	(1.2)	344	3.7	(1.3)
	incomplete/incorrect connection instructions	690	4.7	(1.3)	346	4.8	(1.3)	344	4.7	(1.3)
	inadequate adult supervision	690	1.7	(1.2)	346	1.7	(1.3)	344	1.6	(1.2)
	other family responsibilities	690	3.6	(1.8)	346	3.5	(1.8)	344	3.7	(1.9)
	other reasons	690	6.1	(1.9)	346	6.2	(1.8)	344	6.0	(2.0)
Middle school	no/limited Wi-Fi	514	3.4	(1.4)	170	3.1	(1.3)	344	3.6	(1.4)
	no technology device	514	5.2	(1.3)	170	4.9	(1.4)	344	5.3	(1.3)
	hardware issues	514	4.1	(1.2)	170	4.4	(1.2)	344	4.0	(1.2)
	incomplete/incorrect connection instructions	514	5.1	(1.3)	170	5.2	(1.3)	344	5.1	(1.3)
	inadequate adult supervision	514	1.5	(1.0)	170	1.6	(1.1)	344	1.5	(.9)
	other family responsibilities	514	3.0	(1.5)	170	2.9	(1.4)	344	3.1	(1.6)
	other reasons	514	5.5	(2.3)	170	5.9	(2.0)	344	5.4	(2.4)
High school	no/limited Wi-Fi	793	3.4	(1.5)	261	3.0	(1.4)	532	3.6	(1.5)
	no technology device	793	5.0	(1.4)	261	4.7	(1.5)	532	5.1	(1.4)
	hardware issues	793	4.2	(1.3)	261	4.4	(1.3)	532	4.2	(1.3)
	incomplete/incorrect connection instructions	793	5.3	(1.3)	261	5.2	(1.3)	532	5.3	(1.3)
	inadequate adult supervision	793	2.2	(1.5)	261	2.5	(1.6)	532	2.0	(1.4)
	other family responsibilities	793	2.8	(1.6)	261	2.5	(1.6)	532	3.0	(1.6)
	other reasons	793	5.1	(2.6)	261	5.7	(2.3)	532	4.9	(2.7)
Multiple levels,	no/limited Wi-Fi	287	3.3	(1.5)	104	3.0	(1.5)	183	3.4	(1.6)
ungraded, or unknown	no technology device	287	5.0	(1.4)	104	4.6	(1.5)	183	5.2	(1.4)
	hardware issues	287	3.9	(1.3)	104	3.9	(1.3)	183	3.9	(1.3)
	incomplete/incorrect connection instructions	287	5.0	(1.4)	104	5.1	(1.3)	183	4.9	(1.4)
	inadequate adult supervision	287	1.9	(1.4)	104	2.1	(1.6)	183	1.8	(1.3)
	other family responsibilities	287	3.3	(1.7)	104	3.0	(1.7)	183	3.4	(1.7)
	other reasons	287	5.6	(2.3)	104	6.2	(1.8)	183	5.3	(2.5)

Please note, teachers were asked to rank order the options listed above, with the highest ranked option receiving a score of 1 and the lowest ranked option receiving a score of 7.

		District Type									
		Ov	erall	Alliance	e districts	Non-Allia	nce districts	APS	SEPs		
	_	Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid		
		Count	Percent	Count	Percent	Count	Percent	Count	Percent		
Elementary School	Much less of a problem	19	11.0	7	21.2	10	8.5	2	8.7		
	Somewhat less of a problem	13	7.5	2	6.1	9	7.7	2	8.7		
	About the same	100	57.8	13	39.4	69	59.0	18	78.3		
	Somewhat more of a problem	33	19.1	5	15.2	27	23.1	1	4.3		
	Much more of a problem	8	4.6	6	18.2	2	1.7	0	.0		
	Total N	173	100.0	33	100.0	117	100.0	23	100.0		
Middle School	Much less of a problem	9	5.3	1	3.1	6	5.5	2	6.9		
	Somewhat less of a problem	10	5.8	4	12.5	4	3.6	2	6.9		
	About the same	80	46.8	10	31.3	48	43.6	22	75.9		
	Somewhat more of a problem	51	29.8	11	34.4	37	33.6	3	10.3		
	Much more of a problem	21	12.3	6	18.8	15	13.6	0	.0		
	Total N	171	100.0	32	100.0	110	100.0	29	100.0		
High School	Much less of a problem	5	3.1	0	.0	4	4.2	1	2.9		
	Somewhat less of a problem	8	4.9	3	9.7	2	2.1	3	8.6		
	About the same	64	39.5	9	29.0	32	33.3	23	65.7		
	Somewhat more of a problem	54	33.3	12	38.7	35	36.5	7	20.0		
	Much more of a problem	31	19.1	7	22.6	23	24.0	1	2.9		
	Total N	162	100.0	31	100.0	96	100.0	35	100.0		

 Table C57. District-reported changes in digital cheating by grade level

 District Inventory Q45emh\_2. How problematic was digital cheating during the pandemic compared to before the pandemic?

## Table C58. Teacher-reported changes in digital cheating by grade level

Teacher Survey Q25\_2. Based on your experience, how problematic was digital cheating for your students during the pandemic, compared to before the pandemic?

					Distric	t Type	
		Ov	erall	Alliance	e districts	Non-Allia	nce districts
		Valid	Valid	Valid	Valid	Valid	Valid
		Count	Percent	Count	Percent	Count	Percent
Elementary school	Much less of a problem	30	5.7	9	3.7	21	7.3
	Somewhat less of a problem	8	1.5	6	2.5	2	.7
	About the same	195	36.8	75	31.1	120	41.5
	Somewhat more of a problem	181	34.2	83	34.4	98	33.9
	Much more of a problem	116	21.9	68	28.2	48	16.6
	Total N	530	100.0	241	100.0	289	100.0
Middle school	Much less of a problem	2	.4	0	.0	2	.6
	Somewhat less of a problem	10	2.0	6	4.0	4	1.1
	About the same	137	27.6	43	28.9	94	27.0
	Somewhat more of a problem	177	35.6	47	31.5	130	37.4
	Much more of a problem	171	34.4	53	35.6	118	33.9
	Total N	497	100.0	149	100.0	348	100.0
High school	Much less of a problem	9	1.1	3	1.3	6	1.1
	Somewhat less of a problem	6	.8	2	.8	4	.7
	About the same	131	16.6	60	25.2	71	12.8
	Somewhat more of a problem	217	27.4	59	24.8	158	28.6
	Much more of a problem	428	54.1	114	47.9	314	56.8
	Total N	791	100.0	238	100.0	553	100.0
Multiple levels,	Much less of a problem	4	1.7	1	1.3	3	1.9
ungraded, or	Somewhat less of a problem	3	1.3	0	.0	3	1.9
unknown	About the same	75	31.5	29	36.7	46	28.9
	Somewhat more of a problem	88	37.0	29	36.7	59	37.1
	Much more of a problem	68	28.6	20	25.3	48	30.2
	Total N	238	100.0	79	100.0	159	100.0

#### Table C59. Teacher-reported of changes in school/homework avoidance by grade level

Teacher Survey Q25\_1. Based on your experience, how problematic was school/homework avoidance for your students during the pandemic, compared to before the pandemic?

		District Type										
		Ov	erall	Alliance	e districts	Non-Allia	nce districts					
		Valid	Valid	Valid	Valid	Valid	Valid					
		Count	Percent	Count	Percent	Count	Percent					
Elementary school	Much less of a problem	13	1.5	6	1.6	7	1.4					
	Somewhat less of a problem	18	2.0	8	2.2	10	1.9					
	About the same	201	22.7	66	17.8	135	26.3					
	Somewhat more of a problem	311	35.2	117	31.6	194	37.7					
	Much more of a problem	341	38.6	173	46.8	168	32.7					
	Total N	884	100.0	370	100.0	514	100.0					
Middle school	Much less of a problem	2	.4	2	1.2	0	.0					
	Somewhat less of a problem	5	.9	1	.6	4	1.1					
	About the same	50	9.4	17	10.1	33	9.0					
	Somewhat more of a problem	148	27.7	44	26.2	104	28.4					
	Much more of a problem	329	61.6	104	61.9	225	61.5					
	Total N	534	100.0	168	100.0	366	100.0					
High school	Much less of a problem	4	.5	0	.0	4	.7					
	Somewhat less of a problem	11	1.3	5	2.0	6	1.0					
	About the same	69	8.4	28	11.2	41	7.1					
	Somewhat more of a problem	232	28.1	59	23.5	173	30.1					
	Much more of a problem	509	61.7	159	63.3	350	61.0					
	Total N	825	100.0	251	100.0	574	100.0					
Multiple levels,	Much less of a problem	4	1.3	2	2.0	2	1.0					
ungraded, or	Somewhat less of a problem	4	1.3	2	2.0	2	1.0					
unknown	About the same	37	12.1	11	10.8	26	12.7					
	Somewhat more of a problem	89	29.1	26	25.5	63	30.9					
	Much more of a problem	172	56.2	61	59.8	111	54.4					
	Total N	306	100.0	102	100.0	204	100.0					

#### Table C60. Teacher-reported challenges and benefits of different learning formats

Teacher survey Q36. Is there anything else you'd like to share about your experiences as a Connecticut teacher during the COVID-19 pandemic?

Respondents used the open-ended question at the end of the teacher survey to share their perspectives on the challenges and benefits of different learning models. Teacher survey respondents said that for many students, remote learning was not an effective format for an extended period of time. Remote learning was particularly challenging for courses or subjects that have components of hands-on learning and movement. On the other hand, teacher survey respondents reported that remote learning worked well for a small subset of students who were highly motivated, had strong parental support, or had behavioral or mental health challenges. Teachers believed that remote learning could be an effective form of instruction with adequate resources, like stable internet and laptops. Many suggested the use of remote learning for snow days in lieu of extending the school year through the summer.

Teacher survey respondents reported that a major challenge of in-person learning was stress about getting sick. In addition, the transition back to in-person learning after being out of the classroom for an extended period of time was challenging for students and teachers alike. Returning to the pre-pandemic norm of in-person teaching was also difficult because of COVID-related constraints. For example, teachers reported that it was difficult to provide "support to struggling students from 6+ feet away." Some respondents indicated that scheduling changes (for example, longer blocks) that were introduced during remote learning made instruction more difficult after the return to in-person learning. However, many teacher survey respondents said believed that in-person learning was better overall for students. Teachers said that in-person learning provided fewer chances for students to avoid doing work and more opportunities for student socialization and connection to other school services. Teacher survey participants reported that students performed better academically and emotionally when learning in person. Many respondents emphasized in-person learning should be the instructional format of choice as long as a safe school environment could be maintained.

Overall, teacher survey respondents overwhelmingly reported that hybrid instruction was the least effective instructional format. In the case of dual instruction (hybrid instruction where a teacher delivers instruction to in-person and remote students simultaneously), many respondents stated it was hard to focus on both groups of learners at the same time. They felt like they were "neglecting one group while trying to balance everyone's needs." Others compared hybrid learning to working two jobs at the same time. One teacher said "you would not expect a teacher to teach in two classrooms (across the hall from each other) at the same time while physically in the building with students. Yet, that is what we were doing while teaching with our hybrid model." Teachers said they could not do their job effectively in the hybrid model, which added to the stress they already felt. However, some teachers reported that they appreciated some components of alternating hybrid models (hybrid instruction where teachers instruct students in-person at some times and remotely at other times), for example, hybrid models with one or more fully remote day, which provided planning time.

## **Research Question 1d. How did approaches to remote learning change over time, and how did these changes affect teachers and students?**

#### Table C61. District-reported virtual learning opportunities for elementary students prior to the COVID-19 pandemic

District Inventory: Q4\_1e - Q4\_3e. Which of the following accurately describes learning opportunities for your district's elementary school students prior to the COVID-19 pandemic (before March 2020)? Please select all that apply.

					Distri	ct Type		
	Overall		Allianc	Alliance districts		Non-Alliance districts		SEPs
	Valid	Valid Valid		Valid	Valid	Valid	Valid	Valid
	Count	Percent	Count	Percent	Count	Percent	Count	Percent
Some students were learning virtually (for example,	17	8.8	3	9.4	10	7.7	4	12.9
through online platforms or video conferencing)								
Some teachers were teaching virtually	9	4.7	1	3.1	5	3.8	3	9.7
The district had the capability to manage & deliver	35	18.1	5	15.6	25	19.2	5	16.1
virtual/remote learning								
None of the above	150	77.7	25	78.1	99	76.2	26	83.9
Total N	193	100.0	32	100.0	130	100.0	31	100.0

 Table C62. District-reported virtual learning opportunities for middle school students prior to the COVID-19 pandemic

*District Inventory:* Q4\_1m - Q4\_3m. Which of the following accurately describes learning opportunities for your district's middle school students prior to the COVID-19 pandemic (before March 2020)? Please select all that apply.

					Distri	ct Type		
	Ov	Overall Valid Valid		Alliance districts		Non-Alliance districts		SEPs
	Valid			Valid	Valid	Valid	Valid	Valid
	Count	Percent	Count	Percent	Count	Percent	Count	Percent
Some students were learning virtually (for	19	10.1	4	12.9	11	9.0	4	11.1
example, through online platforms or video								
conferencing)								
Some teachers were teaching virtually	9	4.8	1	3.2	5	4.1	3	8.3
The district had the capability to manage &	48	25.4	5	16.1	36	29.5	7	19.4
deliver virtual/remote learning								
None of the above	135	71.4	23	74.2	83	68.0	29	80.6
Total N	189	100.0	31	100.0	122	100.0	36	100.0

#### Table C63. District-reported virtual learning opportunities for high school students prior to the COVID-19 pandemic

District Inventory: Q4h\_1 - Q4h\_3. Which of the following accurately describes learning opportunities for your district's high school students prior to the COVID-19 pandemic (before March 2020)? Please select all that apply.

		District Type							
	Overall		Alliance districts		Non-Alliance districts		AP	SEPs	
	Valid	Valid Valid		Valid	Valid	Valid	Valid	Valid	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	
Some students were learning virtually (for example, through online platforms or video conferencing)	52	30.1	13	43.3	33	32.7	6	14.3	
Some teachers were teaching virtually	18	10.4	1	3.3	12	11.9	5	11.9	
The district had the capability to manage & deliver virtual/remote learning	55	31.8	9	30.0	36	35.6	10	23.8	
None of the above	93	53.8	13	43.3	49	48.5	31	73.8	
Total N	173	100.0	30	100.0	101	100.0	42	100.0	

#### Table C64. Teacher-reported pre-COVID teaching experience by grade level with learning models

Teacher Survey Q5. Which of the following models had you used to teach students before the COVID-19 pandemic? Please select all that apply.

					Distric	et Type	
		Ov	erall	Alliance	e districts	Non-Allia	nce districts
		Valid	Valid	Valid	Valid	Valid	Valid
		Count	Percent	Count	Percent	Count	Percent
Elementary	Fully in-person instruction	992	99.6	410	99.5	582	99.7
school	Hybrid model, with in-person instruction and remote instruction at the same time	10	1.0	6	1.5	4	.7
	Hybrid model, with in-person instruction and remote instruction at different times	4	.4	2	.5	2	.3
	Fully remote instruction, where students received at least one real-time class each school day	4	.4	2	.5	2	.3
	Fully remote instruction, where students received less than one real-time class each school day	4	.4	3	.7	1	.2
	Total N	996	100.0	412	100.0	584	100.0
Middle school	Fully in-person instruction	563	99.8	178	100.0	385	99.7
	Hybrid model, with in-person instruction and remote instruction at the same time	1	.2	1	.6	0	.0
	Hybrid model, with in-person instruction and remote instruction at different times	2	.4	1	.6	1	.3
	Fully remote instruction, where students received at least one real-time class each school day	3	.5	1	.6	2	.5
	Fully remote instruction, where students received less than one real-time class each school day	6	1.1	2	1.1	4	1.0
	Total N	564	100.0	178	100.0	386	100.0
High school	Fully in-person instruction	875	99.7	271	99.6	604	99.7
	Hybrid model, with in-person instruction and remote instruction at the same time	9	1.0	5	1.8	4	.7
	Hybrid model, with in-person instruction and remote instruction at different times	6	.7	4	1.5	2	.3
	Fully remote instruction, where students received at least one real-time class each school day	4	.5	3	1.1	1	.2
	Fully remote instruction, where students received less than one real-time class each school day	6	.7	3	1.1	3	.5
	Total N	878	100.0	272	100.0	606	100.0
Multiple levels,	Fully in-person instruction	332	98.5	108	98.2	224	98.7
ungraded, or	Hybrid model, with in-person instruction and remote instruction at the same time	4	1.2	3	2.7	1	.4
unknown	Hybrid model, with in-person instruction and remote instruction at different times	4	1.2	1	.9	3	1.3
	Fully remote instruction, where students received at least one real-time class each school day	5	1.5	2	1.8	3	1.3
	Fully remote instruction, where students received less than one real-time class each school day	5	1.5	0	.0	5	2.2
	Total N	337	100.0	110	100.0	227	100.0

Please note that the response options were listed as follows for learning models used before the COVID-19 pandemic: Fully in-person instruction; Hybrid model where I provided in-person instruction and remote instruction concurrently (i.e., at the same time); Hybrid model, where I provided in-person instruction and remote instruction at different times (not concurrently); Fully remote instruction, where my students received at least one synchronous/real-time class each school day (for example, classes via zoom); Fully remote instruction, where my students received less than one synchronous/real-time class each school day (i.e., instruction via paper workbooks or asynchronous videos).

	District Type							
	Ove	erall	Alliance	e districts	Non-Alliance districts		APSEPs	
	Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid
	Count	Percent	Count	Percent	Count	Percent	Count	Percent
It did not change	2	1.1	0	.0	0	.0	2	7.1
Better learning management system in place	116	62.7	23	69.7	78	62.9	15	53.6
Better apps in place	133	71.9	24	72.7	92	74.2	17	60.7
Improved accessibility for students	127	68.6	28	84.8	80	64.5	19	67.9
Teacher fluency with remote learning technologies	178	96.2	32	97.0	121	97.6	25	89.3
Teachers' integration of recommended apps/tools	160	86.5	30	90.9	109	87.9	21	75.0
Improved technical support for teachers	123	66.5	26	78.8	80	64.5	17	60.7
Increased implementation of on-grade curriculum	108	58.4	22	66.7	76	61.3	10	35.7
Other (please describe):	17	9.2	4	12.1	13	10.5	0	.0
Overall	185	100.0	33	100.0	124	100.0	28	100.0

#### Table C65. District-reported improvements to remote learning for elementary students

District Inventory Q36e. In what ways did remote learning improve for elementary students from 2019-20 to 2020-21?

Of the 17 districts that used the open-text option to describe other ways that remote learning for elementary students improved from 2019-2020 to 2020-2021, responses primarily focused on changes in learning format, better understanding of remote learning models, and integration of parent/teacher feedback. Several districts reported that in the 2020-21 school year, there was a shift to more synchronous learning as opposed to completely asynchronous/remote learning. This shift was accompanied by better instructional strategies to benefit both students and staff, such as more breaks in instructional time and better screen-time expectations. Some districts also reported that in the 2020-21 school year, they completely separated remote and in-person learners and assigned different teachers to these respective virtual and in-person classrooms, thus maximizing the effectiveness of the teachers' instructional time. Furthermore, a heightened understanding and more realistic expectations for student learning over remote platforms emerged as districts became more accustomed to this learning format. They recognized that the development of both social-emotional and academic skills is different when it occurs through remote learning platforms, and staff began to gain a better understanding of how to support student learning during the 2020-21 year. Districts reported that they conducted listening sessions with teachers, parents, and students and used their feedback to inform improvements in remote learning.

	District Type								
	Ove	erall	Alliance	districts	Non-Alliance districts		APSEPs		
	Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	
It did not change	2	1.1	0	.0	0	.0	2	6.1	
Better learning management system in place	108	60.0	23	74.2	68	58.6	17	51.5	
Better apps in place	130	72.2	27	87.1	84	72.4	19	57.6	
Improved accessibility for students	115	63.9	24	77.4	73	62.9	18	54.5	
Teacher fluency with remote learning technologies	170	94.4	30	96.8	111	95.7	29	87.9	
Teacher's integration of recommended apps/tools	154	85.6	28	90.3	102	87.9	24	72.7	
Improved technical support for teachers	119	66.1	23	74.2	78	67.2	18	54.5	
Increased implementation of on-grade curriculum	99	55.0	20	64.5	70	60.3	9	27.3	
Other (please describe):	12	6.7	2	6.5	9	7.8	1	3.0	
Overall	180	100.0	31	100.0	116	100.0	33	100.0	

#### Table C66. District-reported improvements to remote learning for middle school students

District Inventory Q36m. In what ways did remote learning improve for middle school students from 2019-20 to 2020-21?

Of the 12 districts that used the open-text option to describe other ways that remote learning for middle school students improved from 2019-2020 to 2020-2021, responses primarily focused on changes in learning format, better understanding of remote learning models, better access to a variety of approved online platforms, and a better understanding of supporting SEL during remote learning. Several districts reported that in the 2020-21 school year, there was a shift to more in-person learning for those that were previously hybrid and to more synchronous learning for those who were still learning remotely. This shift was accompanied by better instructional strategies to benefit both students and staff, such as more breaks in instructional time and more reasonable screen-time expectations. Furthermore, a heightened understanding and more realistic expectations for student learning over remote platforms emerged as districts became more accustomed to this learning format. They recognized that the development of both social-emotional and academic skills is different when it occurs through remote learning platforms, and staff began to gain a better understanding of how to support students' learning during the 2020-21 year.

#### Table C67. District-reported improvements to remote learning for high school students

					Distrie	et Type		
	Ove	erall	Alliance	e districts	Non-Alliance districts		APSEPs	
	Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid
	Count	Percent	Count	Percent	Count	Percent	Count	Percent
It did not change	2	1.2	0	.0	0	.0	2	4.7
Better learning management system in place	102	59.3	25	80.6	52	53.1	25	58.1
Better apps in place	120	69.8	28	90.3	71	72.4	21	48.8
Improved accessibility for students	115	66.9	26	83.9	65	66.3	24	55.8
Teacher fluency with remote learning technologies	162	94.2	30	96.8	96	98.0	36	83.7
Teacher's integration of recommended apps/tools	146	84.9	29	93.5	88	89.8	29	67.4
Improved technical support for teachers	116	67.4	24	77.4	69	70.4	23	53.5
Increased implementation of on-grade curriculum	91	52.9	20	64.5	59	60.2	12	27.9
Other (please describe):	8	4.7	1	3.2	6	6.1	1	2.3
Overall	172	100.0	31	100.0	98	100.0	43	100.0

District Inventory Q36h. In what ways did remote learning improve for high school students from 2019-20 to 2020-21?

Of the 8 districts that used the open-text option to describe other ways that remote learning for high school students improved from 2019-2020 to 2020-2021, responses largely focused on adjustments to the learning format and attempts to increase student engagement and accountability. Districts reported that instructional formats changed between spring 2020 and fall 2020, and over the 2020-21 school year. An increase in synchronous learning was repeatedly mentioned as schools sought to improve the effectiveness of remote learning models. Districts reported schedule adjustments, such as transitioning hybrid students to in-person learning and separating in-person learners from fully remote learnings by creating a remote academy. Districts also reported that they allocated more time to teachers in the 2020-21 school year for training, planning, and meeting with remote students. Several districts discussed attempts to increase student engagement and accountability. One district reported that they tried to require teachers and students to have their cameras on during instructional time, but that this effort was met with resistance from the staff. Another district reported that they improved student accountability by improving their attendance tracking.

#### Table C68. Teacher-reported improvements to remote/hybrid instruction for elementary school students

Teacher Survey Q23. In what ways did your approach to remote/hybrid instruction improve from 2019-20 to 2020-21? (Elementary teachers)

	District Type							
	Ov	erall	Allianc	e districts	Non-Allia	nce districts		
	Valid Count	Valid Percent	Valid Count	Valid Percent	Valid Count	Valid Percent		
I became more knowledgeable about available learning technologies	691	88.0	284	86.3	407	89.3		
I became more comfortable using available learning technologies	723	92.1	301	91.5	422	92.5		
I became more knowledgeable about the effective integration of learning technologies	519	66.1	207	62.9	312	68.4		
I now consider accessibility by all students when selecting learning technologies	351	44.7	139	42.2	212	46.5		
I became more comfortable designing lessons that could be completed remotely	602	76.7	241	73.3	361	79.2		
I became more comfortable communicating with students when they were learning from home	571	72.7	234	71.1	337	73.9		
I became more comfortable communicating with the parents of remote/hybrid students	530	67.5	226	68.7	304	66.7		
Other (please describe):	34	4.3	13	4.0	21	4.6		
Total N	785	100.0	329	100.0	456	100.0		

#### Table C69. Teacher-reported improvements to remote/hybrid instruction for middle school students

Teacher Survey Q23. In what ways did your approach to remote/hybrid instruction improve from 2019-20 to 2020-21? (Middle school teachers)

	District Type							
	Ov	erall	Allianc	e districts	Non-Allia	nce districts		
	Valid Count	Valid Percent	Valid Count	Valid Percent	Valid Count	Valid Percent		
I became more knowledgeable about available learning technologies	435	86.3	134	84.8	301	87.0		
I became more comfortable using available learning technologies	445	88.3	140	88.6	305	88.2		
I became more knowledgeable about the effective integration of learning technologies	337	66.9	106	67.1	231	66.8		
I now consider accessibility by all students when selecting learning technologies	254	50.4	82	51.9	172	49.7		
I became more comfortable designing lessons that could be completed remotely	407	80.8	126	79.7	281	81.2		
I became more comfortable communicating with students when they were learning from home	351	69.6	113	71.5	238	68.8		
I became more comfortable communicating with the parents of remote/hybrid students	268	53.2	86	54.4	182	52.6		
Other (please describe):	21	4.2	9	5.7	12	3.5		
Total N	504	100.0	158	100.0	346	100.0		

#### Table C70. Teacher-reported improvements to remote/hybrid instruction for high school students

Teacher Survey Q23. In what ways did your approach to remote/hybrid instruction improve from 2019-20 to 2020-21? (High school teachers)

	District Type								
	Ov	erall	Allianc	e districts	Non-Allia	nce districts			
	Valid Count	Valid Percent	Valid Count	Valid Percent	Valid Count	Valid Percent			
I became more knowledgeable about available learning technologies	634	83.0	185	80.1	449	84.2			
I became more comfortable using available learning technologies	662	86.6	196	84.8	466	87.4			
I became more knowledgeable about the effective integration of learning technologies	513	67.1	151	65.4	362	67.9			
I now consider accessibility by all students when selecting learning technologies	331	43.3	114	49.4	217	40.7			
I became more comfortable designing lessons that could be completed remotely	605	79.2	184	79.7	421	79.0			
I became more comfortable communicating with students when they were learning from home	490	64.1	150	64.9	340	63.8			
I became more comfortable communicating with the parents of remote/hybrid students	326	42.7	103	44.6	223	41.8			
Other (please describe):	44	5.8	13	5.6	31	5.8			
Total N	764	100.0	231	100.0	533	100.0			

#### Table C71. Teacher-reported improvements to remote/hybrid instruction for students (mixed-level teachers)

Teacher Survey Q23. In what ways did your approach to remote/hybrid instruction improve from 2019-20 to 2020-21? (Teachers who selected multiple levels, no levels, or "ungraded")

	District Type								
	Ov	erall	Allianc	e districts	Non-Allia	nce districts			
	Valid Count	Valid Percent	Valid Count	Valid Percent	Valid Count	Valid Percent			
I became more knowledgeable about available learning technologies	250	90.9	75	87.2	175	92.6			
I became more comfortable using available learning technologies	246	89.5	74	86.0	172	91.0			
I became more knowledgeable about the effective integration of learning technologies	187	68.0	57	66.3	130	68.8			
I now consider accessibility by all students when selecting learning technologies	150	54.5	43	50.0	107	56.6			
I became more comfortable designing lessons that could be completed remotely	215	78.2	66	76.7	149	78.8			
I became more comfortable communicating with students when they were learning from home	188	68.4	63	73.3	125	66.1			
I became more comfortable communicating with the parents of remote/hybrid students	158	57.5	51	59.3	107	56.6			
Other (please describe):	17	6.2	6	7.0	11	5.8			
Total N	275	100.0	86	100.0	189	100.0			

Of all the teachers who used the open-text option to share other ways their approach to remote/hybrid instruction improved from 2019-20 to 2020-21, a substantial number of teachers reported that remote teaching remained extremely challenging. At the same time, many teachers were able to describe specific ways that remote/hybrid instruction had improved, including increased familiarity with the learning format and available technologies, along with a better understanding of how to engage students virtually. Teachers reported that they had become more comfortable using apps and technology tools like Zoom and learning management platforms like Google Classroom, as well as troubleshooting when technology issues arose. Teachers reported that they learned better strategies for monitoring and increasing student engagement, such as how to monitor student devices, how to implement small group work and breakout rooms, and how to create individual connections with their students virtually. Teachers said they had improved at creating engaging digital content for their students; by the end of 2020-21, teachers had spent a great deal of time adapting their lessons and resources to a virtual format. As they gained experience with remote teaching, teacher reported that they could better provide personalized instruction and feedback to students virtually. Teachers also reported that they developed more realistic expectations for

the benefits and limitations of how students learn virtually; for example, several teachers mentioned that they adjusted the focus or pace of instruction. Remote learning enabled teachers to gain a better understanding of students' home life and more appreciation for the value of interpersonal interactions, whether in-person or virtual; many reported that they embedded social-emotional learning into their online lessons. Many teachers reported that collaboration with peers was invaluable as they worked to improve remote/hybrid instruction, especially when formal professional development was inadequate or inaccessible. Teachers also said they learned to be extremely adaptable in their teaching.

Multiple teachers reported that technology access for all students in the 2020-21 school year was a game-changer for remote learning. Other teachers reported policy changes that allowed them to require participation in synchronous classes, meaning that there was more accountability for student participation in remote instruction. Outside of student-related improvements, several teachers said that they strived to better manage expectations for themselves and maintain a healthier work-life balance. However, of the 116 teachers that used the open-text option, 22 reported that there were no improvements in their approach to remote/hybrid learning. Some of these teachers said that they were extremely overwhelmed, frustrated, and burned out; some noted that this frustration stemmed from inadequate support or unrealistic expectations from their district or school leaders, while others mentioned decreased student and parental engagement in the 2020-21 school year.

							Distric	t Type		
			Overall			Alliance distric	ts	Non-Alliance districts Mean		
			Mean			Mean				
		Ν	Percent	(SD)	N	Percent	(SD)	Ν	Percent	(SD)
Elementary school	2019-20	928	68.5	(17.6)	380	65.4	(19.5)	548	70.6	(15.8)
	2020-21	963	72.9	(18.5)	398	69.2	(19.3)	565	75.6	(17.5)
	2021-22	902	88.0	(14.4)	377	86.6	(14.6)	525	89.1	(14.2)
Middle school	2019-20	541	72.0	(17.5)	170	71.1	(19.1)	371	72.4	(16.8)
	2020-21	560	72.1	(18.2)	178	69.2	(19.4)	382	73.4	(17.5)
	2021-22	532	85.0	(15.9)	166	84.2	(15.9)	366	85.4	(15.9)
High school	2019-20	853	72.9	(17.2)	266	70.3	(18.9)	587	74.1	(16.2)
	2020-21	850	69.2	(17.3)	262	65.9	(18.2)	588	70.6	(16.7)
	2021-22	830	83.6	(15.0)	250	80.8	(16.3)	580	84.7	(14.3)
Multiple levels,	2019-20	313	65.9	(21.5)	102	62.1	(24.1)	211	67.7	(20.0)
ungraded, or	2020-21	325	65.9	(20.5)	104	58.3	(22.4)	221	69.5	(18.6)
unknown	2021-22	305	84.6	(16.6)	100	79.7	(20.6)	205	86.9	(13.6)

#### Table C72. Teacher-reported changes by grade level in the proportion of the curriculum they were able to cover

*Teacher Survey Q15. Of the curriculum content you would have typically covered across the school year before the pandemic, approximately what proportion were you able to cover in the following time periods?* 

Please note, mean percent describes the mean of each participating district's reported value.

#### Table C73. Teacher-reported changes in different learning models

Teacher survey Q36. Is there anything else you'd like to share about your experiences as a Connecticut teacher during the COVID-19 pandemic?

Many teacher survey respondents used the open-ended question at the end of the survey to reflect on changes in learning models between the 2019-2020 and 2020-2021 school years. Teachers reported that at the start of the 2020-21 school year, they felt the impact of minimal learning near the end of the 2019-2020 school year. When school re-opened with hybrid or fully in-person models, some teachers said that their schools had no plan for instruction. Other teachers reported that once in-person instruction began, they began to feel more prepared and found that learning was much more effective. Teachers also reported that having even a small amount of in-person learning during the 2020-2021 academic year improved students' mental health.

Teacher survey respondents reflected on many changes in learning models that occurred during the 2020-2021 school year. One teacher described starting the year in person, then switching to non-concurrent hybrid, then to remote, then to concurrent hybrid. Teachers reported that the constant changes between learning models were exhausting and stressful. Teachers also noted that teachers and students were constantly moving in and out of quarantine during the 2020-2021 academic year, which was very disruptive to learning. Students were often at different stages in learning material, and teachers found it challenging to monitor each student's academic progress.

### Appendix D: Supports for students (Research Goal 2)

# Research Question 2a. What do administrators and teachers say about the pandemic's effects on students and their families?

#### Table D1. Teacher-reported student academic behaviors by grade level in 2020

*Teacher Survey Q7a - Q7e. When students were learning remotely during spring 2020 (start of COVID-pandemic), approximately what percent of your students were doing each of the following?* 

							Distric	t Type		
			Overall		А	lliance distri	cts	Non	-Alliance dis	stricts
			Mean			Mean			Mean	
		Ν	Percent	(SD)	Ν	Percent	(SD)	Ν	Percent	(SD)
Elementary	progressing with grade-level learning	921	45.9	(25.0)	374	38.7	(24.0)	547	50.8	(24.5)
school	completing the majority of your assignments	921	50.7	(24.4)	372	43.3	(23.1)	549	55.7	(24.0)
	in contact with you nearly every day	918	54.6	(30.0)	372	48.1	(28.2)	546	59.0	(30.4)
	completing advanced or enrichment content	872	13.0	(18.6)	343	12.6	(18.1)	529	13.2	(18.9)
	performing better than they had in person	849	9.0	(14.9)	333	9.2	(16.1)	516	8.8	(14.1)
Middle school	progressing with grade-level learning	542	51.5	(25.3)	170	46.0	(24.9)	372	54.1	(25.0)
	completing the majority of your assignments	543	55.2	(24.5)	170	48.2	(25.7)	373	58.4	(23.3)
	in contact with you nearly every day	537	46.6	(29.5)	168	46.8	(30.3)	369	46.5	(29.2)
	completing advanced or enrichment content	508	14.4	(20.5)	160	13.8	(22.4)	348	14.7	(19.6)
	performing better than they had in person	510	13.1	(15.6)	158	14.9	(17.3)	352	12.3	(14.8)
High school	progressing with grade-level learning	840	52.6	(25.9)	256	47.8	(24.9)	584	54.7	(26.1)
	completing the majority of your assignments	841	55.4	(24.8)	257	48.7	(23.4)	584	58.4	(24.8)
	in contact with you nearly every day	839	41.9	(30.6)	256	40.6	(28.2)	583	42.4	(31.6)
	completing advanced or enrichment content	815	18.3	(24.7)	250	17.2	(22.7)	565	18.8	(25.5)
	performing better than they had in person	820	15.1	(19.7)	253	13.4	(17.4)	567	15.9	(20.6)
Multiple levels,	progressing with grade-level learning	311	45.0	(26.4)	100	39.0	(25.6)	211	47.9	(26.4)
ungraded, or	completing the majority of your assignments	311	46.9	(25.0)	100	42.0	(24.1)	211	49.2	(25.2)
unknown	in contact with you nearly every day	307	44.5	(31.3)	99	41.7	(30.2)	208	45.9	(31.8)
	completing advanced or enrichment content	286	12.7	(20.3)	93	14.9	(22.6)	193	11.6	(19.1)
	performing better than they had in person	290	11.8	(15.8)	94	10.9	(14.8)	196	12.2	(16.2)

Please note, mean percent describes the mean of each participating district's reported value.

#### Table D2. Teacher-reported academic behaviors of fully remote students by grade level in 2020-21

Teacher Survey Q11a - Q11e. You indicated that some of your students attended school remotely for the majority of the 2020-21 school year. Over the 2020-21 school year, approximately what percent of your fully in-person students were doing each of the following?

							Distric	t Type		
			Overall		Α	lliance distri	cts	Non	-Alliance dis	stricts
			Mean			Mean		Mean		
		Ν	Percent	(SD)	Ν	Percent	(SD)	Ν	Percent	(SD)
Elementary	progressing with grade-level learning	761	48.0	(30.5)	329	41.9	(29.2)	432	52.7	(30.7)
school	completing the majority of your assignments	761	52.2	(29.8)	329	46.7	(28.3)	432	56.3	(30.2)
	in contact with you nearly every day	747	60.7	(34.6)	323	56.8	(33.0)	424	63.6	(35.6)
	completing advanced or enrichment content	709	16.4	(25.1)	299	14.1	(21.0)	410	18.1	(27.5)
	performing better than they had in person	699	12.6	(22.6)	308	12.9	(22.4)	391	12.4	(22.9)
Middle school	progressing with grade-level learning	485	45.4	(27.8)	160	42.9	(26.5)	325	46.7	(28.4)
	completing the majority of your assignments	485	49.2	(27.0)	160	46.6	(26.3)	325	50.5	(27.3)
	in contact with you nearly every day	482	51.4	(31.4)	159	50.5	(30.5)	323	51.9	(31.8)
	completing advanced or enrichment content	460	11.9	(18.7)	153	15.0	(21.9)	307	10.4	(16.6)
	performing better than they had in person	451	12.1	(18.5)	148	14.4	(17.9)	303	11.0	(18.7)
High school	progressing with grade-level learning	764	45.8	(27.1)	237	42.8	(25.4)	527	47.1	(27.7)
	completing the majority of your assignments	765	49.9	(25.6)	238	46.6	(24.1)	527	51.5	(26.1)
	in contact with you nearly every day	758	44.6	(30.8)	236	42.8	(29.1)	522	45.3	(31.6)
	completing advanced or enrichment content	732	16.4	(23.7)	229	15.5	(20.9)	503	16.9	(24.9)
	performing better than they had in person	736	15.6	(22.1)	230	15.3	(19.6)	506	15.8	(23.1)
Multiple levels,	progressing with grade-level learning	280	43.4	(29.5)	94	35.6	(27.0)	186	47.3	(30.1)
ungraded, or	completing the majority of your assignments	282	47.2	(27.9)	95	39.8	(26.1)	187	50.9	(28.1)
unknown	in contact with you nearly every day	274	48.9	(33.8)	93	40.4	(31.3)	181	53.3	(34.3)
	completing advanced or enrichment content	257	12.6	(20.3)	86	10.9	(14.9)	171	13.5	(22.6)
	performing better than they had in person	258	15.0	(21.8)	89	13.0	(16.9)	169	16.1	(24.0)

Please note, mean percent describes the mean of each participating district's reported value.

								District Typ	e			
		Overall		А	lliance distri	cts	Non	Alliance di	stricts		APSEPs	
		Mean			Mean			Mean			Mean	
	Ν	Percent	(SD)	Ν	Percent	(SD)	Ν	Percent	(SD)	Ν	Percent	(SD)
Elementary												
In contact with their teacher every day	187	80.9	(22.9)	32	77.8	(17.3)	126	83.5	(22.4)	29	72.8	(28.3)
Working on grade-level content	183	82.4	(23.3)	32	81.2	(18.9)	125	87.3	(18.3)	26	60.0	(34.8)
Completing advanced or enrichment content	148	34.2	(30.9)	26	21.2	(17.9)	105	35.4	(31.5)	17	47.1	(36.5)
Middle School												
In contact with their teacher every day	180	77.6	(23.3)	30	68.0	(18.4)	116	81.8	(22.4)	34	71.8	(27.0)
Working on grade-level content	176	81.6	(23.3)	30	80.7	(20.8)	115	87.7	(16.6)	31	60.0	(33.0)
Completing advanced or enrichment content	149	34.5	(28.0)	27	18.5	(12.5)	102	38.3	(29.3)	20	37.0	(29.9)
High School												
In contact with their teacher every day	171	74.9	(23.8)	31	67.1	(18.8)	97	80.5	(21.9)	43	67.9	(27.9)
Working on grade-level content	164	79.7	(22.7)	31	80.6	(18.9)	97	85.7	(18.0)	36	62.8	(28.3)
Completing advanced or enrichment content	140	34.7	(26.3)	29	23.4	(20.9)	88	39.3	(27.9)	23	31.3	(22.0)

**Table D3. District-reported academic behaviors of fully remote students by grade level during the 2020-21 school year** *District Inventory Q31emh. During the 2020-21 school year, approximately what percentage of fully remote students were...* 

Please note, mean percentage describes the mean of each participating district's reported value.

							Distric	t Type			
			Overall		А	Alliance districts			Non-Alliance districts		
			Mean			Mean			Mean		
		Ν	Percent	(SD)	Ν	Percent	(SD)	Ν	Percent	(SD)	
Elementary	progressing with grade-level learning	595	56.1	(24.8)	273	50.9	(24.4)	322	60.5	(24.2)	
school	completing the majority of your assignments	594	58.1	(25.0)	273	52.8	(24.1)	321	62.6	(25.0)	
	in contact with you nearly every day	589	67.0	(30.1)	271	61.5	(28.8)	318	71.6	(30.5)	
	completing advanced or enrichment content	558	15.8	(21.5)	253	16.0	(19.8)	305	15.7	(22.8)	
	performing better than they had in person	555	10.2	(18.0)	254	11.4	(19.2)	301	9.2	(17.0)	
Middle school	progressing with grade-level learning	455	58.4	(23.6)	147	55.2	(24.2)	308	59.9	(23.2)	
	completing the majority of your assignments	454	60.9	(22.2)	147	57.2	(22.3)	307	62.6	(22.0)	
	in contact with you nearly every day	453	63.4	(28.8)	147	61.5	(28.2)	306	64.3	(29.1)	
	completing advanced or enrichment content	436	16.9	(20.9)	140	19.0	(23.6)	296	15.9	(19.5)	
	performing better than they had in person	436	13.7	(17.7)	142	16.8	(19.5)	294	12.2	(16.7)	
High school	progressing with grade-level learning	741	59.6	(22.5)	217	54.1	(23.3)	524	61.8	(21.7)	
	completing the majority of your assignments	741	62.4	(21.5)	218	56.1	(22.3)	523	65.0	(20.6)	
	in contact with you nearly every day	738	57.7	(29.8)	216	52.0	(29.5)	522	60.1	(29.6)	
	completing advanced or enrichment content	717	22.3	(25.8)	213	22.0	(23.3)	504	22.5	(26.8)	
	performing better than they had in person	717	15.9	(21.0)	215	16.9	(22.4)	502	15.5	(20.4)	
Multiple levels,	progressing with grade-level learning	237	50.9	(27.2)	86	45.5	(27.3)	151	54.0	(26.7)	
ungraded, or	completing the majority of your assignments	238	53.5	(25.9)	87	52.0	(26.8)	151	54.4	(25.4)	
unknown	in contact with you nearly every day	233	54.8	(32.8)	84	52.9	(31.3)	149	56.0	(33.7)	
	completing advanced or enrichment content	218	17.2	(25.1)	78	22.1	(27.8)	140	14.6	(23.2)	
	performing better than they had in person	223	15.0	(21.9)	80	17.6	(21.9)	143	13.5	(21.8)	

#### Table D4. Teacher-reported academic behaviors of hybrid students by grade level in 2020-21

*Teacher Survey Q12a and Q12e. You indicated that some of your students were hybrid for the majority of the 2020-21 school year. Over the 2020-21 school year, approximately what percent of your fully in-person students were doing each of the following?* 

Please note, mean percent describes the mean of each participating district's reported value.

#### Table D5. Teacher-reported academic behaviors of fully in-person students by grade level in 2020-21

Teacher Survey Q13a and Q13e. You indicated that some of your students attended school fully in-person for the majority of the 2020-21 school year. Over the 2020-21 school year, approximately what percent of your fully in-person students were doing each of the following?

							Distric	t Type		
			Overall		А	lliance distri	cts	Non-Alliance districts		
		Mean			Mean			Mean		
		Ν	Percent	(SD)	Ν	Percent	(SD)	Ν	Percent	(SD)
Elementary	progressing with grade-level learning	671	72.9	(22.0)	243	66.0	(24.0)	428	76.8	(19.7)
school	completing the majority of your assignments	670	80.8	(19.3)	243	74.7	(21.4)	427	84.2	(17.1)
	completing advanced or enrichment content		28.1	(28.4)	228	23.8	(25.7)	421	30.4	(29.6)
Middle school	progressing with grade-level learning	366	70.4	(22.8)	107	67.1	(24.0)	259	71.7	(22.1)
	completing the majority of your assignments	366	73.3	(20.4)	107	71.8	(20.0)	259	73.9	(20.5)
	completing advanced or enrichment content	351	25.4	(26.0)	104	27.4	(28.2)	247	24.5	(25.1)
High school	progressing with grade-level learning	504	71.5	(21.9)	144	66.5	(23.7)	360	73.5	(20.8)
	completing the majority of your assignments	504	73.5	(21.1)	144	68.9	(22.8)	360	75.3	(20.2)
	completing advanced or enrichment content	495	30.2	(29.3)	142	29.2	(29.0)	353	30.6	(29.5)
Multiple levels,	progressing with grade-level learning	244	66.3	(27.1)	73	58.2	(28.8)	171	69.8	(25.7)
ungraded, or	completing the majority of your assignments	245	71.1	(24.6)	74	64.6	(27.6)	171	73.9	(22.7)
unknown	completing advanced or enrichment content	227	25.8	(30.0)	69	28.3	(31.0)	158	24.7	(29.6)

Please note, mean percent describes the mean of each participating district's reported value.

#### Table D6. Teacher-reported school support by grade level for student learning in 2020-21

Teacher Survey Q24\_2. In your opinion, how adequately did your school support students' academic learning during the 2020-21 school year?

		District Type							
		Ove	erall	Alliance	e districts	Non-Allia	nce districts		
		Valid	Valid	Valid	Valid	Valid	Valid		
		Count	Percent	Count	Percent	Count	Percent		
Elementary school	Support was extremely inadequate	61	7.1	37	10.2	24	4.8		
	Support was somewhat inadequate	177	20.5	88	24.2	89	17.9		
	Support was neither adequate nor inadequate	129	15.0	64	17.6	65	13.1		
	Support was somewhat adequate	381	44.2	141	38.7	240	48.2		
	Support was extremely adequate	114	13.2	34	9.3	80	16.1		
	Total N	862	100.0	364	100.0	498	100.0		
Middle school	Support was extremely inadequate	37	7.2	20	12.3	17	4.8		
	Support was somewhat inadequate	116	22.6	37	22.7	79	22.5		
	Support was neither adequate nor inadequate	86	16.7	28	17.2	58	16.5		
	Support was somewhat adequate	207	40.3	58	35.6	149	42.5		
	Support was extremely adequate	68	13.2	20	12.3	48	13.7		
	Total N	514	100.0	163	100.0	351	100.0		
High school	Support was extremely inadequate	68	8.5	28	11.5	40	7.2		
	Support was somewhat inadequate	208	26.1	77	31.6	131	23.7		
	Support was neither adequate nor inadequate	145	18.2	44	18.0	101	18.3		
	Support was somewhat adequate	314	39.4	77	31.6	237	42.9		
	Support was extremely adequate	62	7.8	18	7.4	44	8.0		
	Total N	797	100.0	244	100.0	553	100.0		
Multiple levels,	Support was extremely inadequate	22	7.5	12	12.0	10	5.2		
ungraded, or	Support was somewhat inadequate	57	19.4	18	18.0	39	20.1		
unknown	Support was neither adequate nor inadequate	54	18.4	18	18.0	36	18.6		
	Support was somewhat adequate	130	44.2	40	40.0	90	46.4		
	Support was extremely adequate	31	10.5	12	12.0	19	9.8		
	Total N	294	100.0	100	100.0	194	100.0		

						Distric	t Type		
		Ov	erall	Alliance	e districts	Non-Allia	nce districts	APS	SEPs
		Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid
		Count	Percent	Count	Percent	Count	Percent	Count	Percent
Elementary School	Much less of a problem	23	12.8	7	21.9	14	11.4	2	8.0
	Somewhat less of a problem	20	11.1	4	12.5	13	10.6	3	12.0
	About the same	95	52.8	12	37.5	70	56.9	13	52.0
	Somewhat more of a problem	28	15.6	3	9.4	22	17.9	3	12.0
	Much more of a problem	14	7.8	6	18.8	4	3.3	4	16.0
	Total N	180	100.0	32	100.0	123	100.0	25	100.0
Middle School	Much less of a problem	11	6.3	1	3.1	8	7.1	2	6.5
	Somewhat less of a problem	18	10.3	5	15.6	10	8.9	3	9.7
	About the same	91	52.0	14	43.8	60	53.6	17	54.8
	Somewhat more of a problem	39	22.3	6	18.8	29	25.9	4	12.9
	Much more of a problem	16	9.1	6	18.8	5	4.5	5	16.1
	Total N	175	100.0	32	100.0	112	100.0	31	100.0
High School	Much less of a problem	9	5.5	0	.0	7	7.3	2	5.4
	Somewhat less of a problem	15	9.1	4	12.9	8	8.3	3	8.1
	About the same	80	48.8	14	45.2	44	45.8	22	59.5
	Somewhat more of a problem	46	28.0	8	25.8	31	32.3	7	18.9
	Much more of a problem	14	8.5	5	16.1	6	6.3	3	8.1
	Total N	164	100.0	31	100.0	96	100.0	37	100.0

 Table D7. District-reported changes in student behavior by grade level: cyberbullying

 District Inventory Q45emh\_1. How problematic was cyberbullying during the pandemic compared to before the pandemic?

#### Table D8. Teacher-reported changes in student behavior by grade level: cyberbullying

Teacher Survey Q25\_3. Based on your experience, how problematic was cyberbullying for your students during the pandemic, compared to before the pandemic?

	_				Distric	t Type	
	_	Ove	erall	Alliance	districts	Non-Alliar	nce districts
		Valid Count	Valid Percent	Valid Count	Valid Percent	Valid Count	Valid Percent
Elementary school	Much less of a problem	39	7.8	19	8.1	20	7.5
	Somewhat less of a problem	12	2.4	6	2.6	6	2.3
	About the same	215	42.9	91	38.7	124	46.6
	Somewhat more of a problem	149	29.7	77	32.8	72	27.1
	Much more of a problem	86	86 17.2 42 17.9		44	16.5	
	Total N	501	100.0	235	100.0	266	100.0
Middle school	Much less of a problem	6	1.3	5	3.5	1	.3
	Somewhat less of a problem	14	3.0	6	4.2	8	2.5
	About the same	177	38.1	46	31.9	131	40.8
	Somewhat more of a problem	126	27.1	34	23.6	92	28.7
	Much more of a problem	142	30.5	53	36.8	89	27.7
	Total N	465	100.0	144	100.0	321	100.0
High school	Much less of a problem	10	1.7	3	1.7	7	1.8
	Somewhat less of a problem	28	4.9	12	6.6	16	4.1
	About the same	266	46.5	84	46.4	182	46.5
	Somewhat more of a problem	156	27.3	47	26.0	109	27.9
	Much more of a problem	112	19.6	35	19.3	77	19.7
	Total N	572	100.0	181	100.0	391	100.0
Multiple levels,	Much less of a problem	6	2.8	5	6.3	1	.7
ungraded, or	Somewhat less of a problem	8	3.8	2	2.5	6	4.5
unknown	About the same	81	38.0	29	36.7	52	38.8
	Somewhat more of a problem	69	32.4	24	30.4	45	33.6
	Much more of a problem	49	23.0	19	24.1	30	22.4
	Total N	213	100.0	79	100.0	134	100.0

						Distric	rt Type		
		Ove	erall	Alliance	e districts	Non-Allia	nce districts	APS	SEPs
		Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid
		Count	Percent	Count	Percent	Count	Percent	Count	Percent
Elementary School	Much less of a problem	2	1.1	0	.0	2	1.7	0	.0
	Somewhat less of a problem	2	1.1	0	.0	1	.8	1	3.4
	About the same	20	10.9	3	9.1	12	9.9	5	17.2
	Somewhat more of a problem	72	39.3	12	36.4	50	41.3	10	34.5
	Much more of a problem	87	47.5	18	54.5	56	46.3	13	44.8
	Total N	183	100.0	33	100.0	121	100.0	29	100.0
Middle School	Much less of a problem	1	.6	0	.0	1	.9	0	.0
	Somewhat less of a problem	2	1.1	0	.0	1	.9	1	3.0
	About the same	21	12.0	2	6.3	13	11.8	6	18.2
	Somewhat more of a problem	69	39.4	14	43.8	47	42.7	8	24.2
	Much more of a problem	82	46.9	16	50.0	48	43.6	18	54.5
	Total N	175	100.0	32	100.0	110	100.0	33	100.0
High School	Much less of a problem	1	.6	0	.0	1	1.0	0	.0
	Somewhat less of a problem	0	.0	0	.0	0	.0	0	.0
	About the same	20	12.0	3	9.7	11	11.5	6	15.4
	Somewhat more of a problem	65	39.2	13	41.9	39	40.6	13	33.3
	Much more of a problem	80	48.2	15	48.4	45	46.9	20	51.3
	Total N	166	100.0	31	100.0	96	100.0	39	100.0

#### Table D9. District-reported changes in student behavior by grade level: excessive screen time

District Inventory Q45emh\_4r. How problematic was excessive screen time during the pandemic compared to before the pandemic?
Table	D10.	Teacher-rep	ported chan	ges in s	student	behavior	bv	grade	level:	excessive screet	a time
1 4010	<b>D I V I</b>	I cacher i c	portea enan		seatene	o chia i loi	$\sim J$	5			

Teacher Survey Q25\_5r. Based on your experience, how problematic was excessive screen time for your students during the pandemic, compared to before the pandemic?

				District Type					
		Ov	erall	Alliance	e districts	Non-Allia	nce districts		
		Valid Count	Valid Percent	Valid Count	Valid Percent	Valid Count	Valid Percent		
Elementary school	Much less of a problem	6	.7	4	1.1	2	.4		
	Somewhat less of a problem	8	.9	2	.5	6	1.2		
	About the same	49	5.6	20	5.5	29	5.7		
	Somewhat more of a problem	215	24.6	81	22.3	134	26.2		
	Much more of a problem	597	68.2	257	70.6	340	66.5		
	Total N	875	100.0	364	100.0	511	100.0		
Middle school	Much less of a problem	2	.4	1	.6	1	.3		
	Somewhat less of a problem	4	.8	0	.0	4	1.1		
	About the same	34	6.5	11	6.7	23	6.4		
	Somewhat more of a problem	102	19.4	30	18.3	72	19.9		
	Much more of a problem	383	73.0	122	74.4	261	72.3		
	Total N	525	100.0	164	100.0	361	100.0		
High school	Much less of a problem	7	.9	2	.9	5	.9		
	Somewhat less of a problem	3	.4	1	.4	2	.4		
	About the same	58	7.4	13	5.7	45	8.2		
	Somewhat more of a problem	157	20.1	45	19.6	112	20.4		
	Much more of a problem	555	71.2	169	73.5	386	70.2		
	Total N	780	100.0	230	100.0	550	100.0		
Multiple levels,	Much less of a problem	4	1.4	2	2.1	2	1.1		
ungraded, or	Somewhat less of a problem	2	.7	1	1.1	1	.5		
unknown	About the same	23	8.1	8	8.4	15	7.9		
	Somewhat more of a problem	66	23.2	19	20.0	47	24.7		
	Much more of a problem	190	66.7	65	68.4	125	65.8		
	Total N	285	100.0	95	100.0	190	100.0		

						Distric	t Type		
		Ove	erall	Alliance	e districts	Non-Allia	nce districts	APS	SEPs
	_	Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid
		Count	Percent	Count	Percent	Count	Percent	Count	Percent
Elementary School	Much less of a problem	1	.5	0	.0	1	.8	0	.0
	Somewhat less of a problem	4	2.1	0	.0	3	2.4	1	3.4
	About the same	18	9.6	3	9.1	10	8.0	5	17.2
	Somewhat more of a problem	83	44.4	10	30.3	67	53.6	6	20.7
	Much more of a problem	81	43.3	20	60.6	44	35.2	17	58.6
	Total N	187	100.0	33	100.0	125	100.0	29	100.0
Middle School	Much less of a problem	2	1.1	0	.0	2	1.7	0	.0
	Somewhat less of a problem	4	2.2	0	.0	2	1.7	2	5.7
	About the same	14	7.7	1	3.1	7	6.0	6	17.1
	Somewhat more of a problem	83	45.4	12	37.5	63	54.3	8	22.9
	Much more of a problem	80	43.7	19	59.4	42	36.2	19	54.3
	Total N	183	100.0	32	100.0	116	100.0	35	100.0
High School	Much less of a problem	1	.6	0	.0	1	1.0	0	.0
	Somewhat less of a problem	2	1.2	0	.0	0	.0	2	4.9
	About the same	16	9.4	2	6.5	6	6.1	8	19.5
	Somewhat more of a problem	67	39.4	10	32.3	49	50.0	8	19.5
	Much more of a problem	84	49.4	19	61.3	42	42.9	23	56.1
	Total N	170	100.0	31	100.0	98	100.0	41	100.0

#### Table D11. District-reported changes in student behavior by grade level: lack of connection to school

District Inventory Q45\_5r. How problematic was lack of connection to school during the pandemic compared to before the pandemic?

					District TypeAlliance districtsNon-Alliance districtsValidValidValidValidCountPercentCountPercent51.35182.11125213.9941812433.22254318449.318535373100.05201031.81.1.651158.940104929.21233310059.519753168100.0366102.81.208.03565522.11963417068.333258249100.05711022.03111.0631212.0188		
		Ov	rerall	Allianc	e districts	Non-Allia	nce districts
		Valid Count	Valid Percent	Valid Count	Valid Percent	Valid Count	Valid Percent
Elementary school	Much less of a problem	10	1.1	5	1.3	5	1.0
-	Somewhat less of a problem	19	2.1	8	2.1	11	2.1
	About the same	146	16.3	52	13.9	94	18.1
	Somewhat more of a problem	349	39.1	124	33.2	225	43.3
	Much more of a problem	369	41.3	184	49.3	185	35.6
	Total N	893	100.0	373	100.0	520	100.0
Middle school	Much less of a problem	4	.7	3	1.8	1	.3
	Somewhat less of a problem	6	1.1	1	.6	5	1.4
	About the same	55	10.3	15	8.9	40	10.9
	Somewhat more of a problem	172	32.2	49	29.2	123	33.6
	Much more of a problem	297	55.6	100	59.5	197	53.8
	Total N	534	100.0	168	100.0	366	100.0
High school	Much less of a problem	3	.4	2	.8	1	.2
	Somewhat less of a problem	9	1.1	2	.8	7	1.2
	About the same	55	6.7	20	8.0	35	6.1
	Somewhat more of a problem	251	30.6	55	22.1	196	34.3
	Much more of a problem	502	61.2	170	68.3	332	58.1
	Total N	820	100.0	249	100.0	571	100.0
Multiple levels,	Much less of a problem	5	1.6	2	2.0	3	1.5
ungraded, or	Somewhat less of a problem	7	2.3	1	1.0	6	3.0
unknown	About the same	31	10.2	13	12.9	18	8.9
	Somewhat more of a problem	105	34.5	34	33.7	71	35.0
	Much more of a problem	156	51.3	51	50.5	105	51.7
	Total N	304	100.0	101	100.0	203	100.0

#### Table D12. Teacher-reported changes in student behavior by grade level: lack of connection to school

Teacher Survey Q25\_6r. Based on your experience, how problematic was lack of connection to school for your students during the pandemic, compared to before the pandemic?

	_					Distric	t Type		
		Ov	erall	Alliance	e districts	Non-Allia	nce districts	APS	SEPs
		Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid
		Count	Percent	Count	Percent	Count	Percent	Count	Percent
Elementary School	Much less of a problem	27	16.6	9	29.0	16	14.7	2	8.7
	Somewhat less of a problem	10	6.1	1	3.2	7	6.4	2	8.7
	About the same	109	66.9	15	48.4	79	72.5	15	65.2
	Somewhat more of a problem	9	5.5	2	6.5	6	5.5	1	4.3
	Much more of a problem	8	4.9	4	12.9	1	.9	3	13.0
	Total N	163	100.0	31	100.0	109	100.0	23	100.0
Middle School	Much less of a problem	13	7.9	2	6.5	9	8.7	2	6.7
	Somewhat less of a problem	12	7.3	3	9.7	7	6.7	2	6.7
	About the same	108	65.5	17	54.8	70	67.3	21	70.0
	Somewhat more of a problem	23	13.9	6	19.4	15	14.4	2	6.7
	Much more of a problem	9	5.5	3	9.7	3	2.9	3	10.0
	Total N	165	100.0	31	100.0	104	100.0	30	100.0
High School	Much less of a problem	7	4.5	1	3.2	5	5.5	1	2.9
	Somewhat less of a problem	12	7.7	1	3.2	8	8.8	3	8.8
	About the same	102	65.4	19	61.3	59	64.8	24	70.6
	Somewhat more of a problem	27	17.3	7	22.6	16	17.6	4	11.8
	Much more of a problem	8	5.1	3	9.7	3	3.3	2	5.9
	Total N	156	100.0	31	100.0	91	100.0	34	100.0

 Table D13. District-reported changes in student behavior by grade level: sexting

 District Inventory Q45emh\_3r. How problematic was sexting during the pandemic compared to before the pandemic?

#### Table D14. Teacher-reported services provided to IEP students by grade level

Teacher Survey Q16. During the 2020-21 school year, to what extent do you believe your students with IEPs received the services specified in their IEPs?

					Distric	et Type	
		Ov	erall	Allianc	e districts	Non-Allia	nce districts
		Valid	Valid	Valid	Valid	Valid	Valid
		Count	Percent	Count	Percent	Count	Percent
Elementary school	Not at all	38	5.8	33	12.0	5	1.3
	Somewhat	313	47.6	146	53.1	167	43.7
	Mostly	231	35.2	81	29.5	150	39.3
	Completely	75	11.4	15	5.5	60	15.7
	Total N	657	100.0	275	100.0	382	100.0
Middle school	Not at all	19	5.1	13	10.5	6	2.4
	Somewhat	195	52.1	72	58.1	123	49.2
	Mostly	133	35.6	36	29.0	97	38.8
	Completely	27	7.2	3	2.4	24	9.6
	Total N	374	100.0	124	100.0	250	100.0
High school	Not at all	41	7.0	21	12.1	20	4.8
	Somewhat	316	53.8	101	58.0	215	52.1
	Mostly	195	33.2	43	24.7	152	36.8
	Completely	35	6.0	9	5.2	26	6.3
	Total N	587	100.0	174	100.0	413	100.0
Multiple levels,	Not at all	21	9.1	12	14.8	9	6.0
ungraded, or	Somewhat	118	51.3	45	55.6	73	49.0
unknown	Mostly	74	32.2	20	24.7	54	36.2
	Completely	17	7.4	4	4.9	13	8.7
	Total N	230	100.0	81	100.0	149	100.0

#### Table D15. Teacher-reported services provided to EL students by grade level

Teacher Survey Q17. During the 2020-21 school year, to what extent do you believe your English learner (EL) students received the services normally provided?

					Distric	et Type	
		Ov	erall	Allianc	e districts	Non-Allia	nce districts
		Valid	Valid	Valid	Valid	Valid	Valid
		Count	Percent	Count	Percent	Count	Percent
Elementary school	Not at all	90	13.7	54	19.6	36	9.4
	Somewhat	315	47.8	142	51.6	173	45.1
	Mostly	183	27.8	62	22.5	121	31.5
	Completely	71	10.8	17	6.2	54	14.1
	Total N	659	100.0	275	100.0	384	100.0
Middle school	Not at all	49	13.0	20	16.1	29	11.5
	Somewhat	211	56.1	77	62.1	134	53.2
	Mostly	94	25.0	24	19.4	70	27.8
	Completely	22	5.9	3	2.4	19	7.5
	Total N	376	100.0	124	100.0	252	100.0
High school	Not at all	92	15.6	29	16.7	63	15.2
	Somewhat	338	57.5	113	64.9	225	54.3
	Mostly	119	20.2	26	14.9	93	22.5
	Completely	39	6.6	6	3.4	33	8.0
	Total N	588	100.0	174	100.0	414	100.0
Multiple levels,	Not at all	31	13.5	13	16.0	18	12.1
ungraded, or	Somewhat	120	52.2	44	54.3	76	51.0
unknown	Mostly	54	23.5	16	19.8	38	25.5
	Completely	25	10.9	8	9.9	17	11.4
	Total N	230	100.0	81	100.0	149	100.0

#### Table D16. Teacher-reported changes in resources/supports needed by elementary students

Teacher Survey Q27_1r to Q27_11r. Based on your experience, how much of a need did your students have for the following	
resources/supports during the pandemic compared to before the pandemic? (Elementary teachers)	
District Type	

						Distric	л гуре			
		Overall		I	Alliance districts			Non-Alliance districts		
	Ν	Mean	(SD)	Ν	Mean	(SD)	Ν	Mean	(SD)	
One-on-one meetings with me	582	4.1	(.9)	240	4.1	(1.0)	342	4.1	(.9)	
Free tutoring (1:1 or small group)	523	4.1	(.9)	221	4.2	(.9)	302	4.1	(.9)	
Meetings with reading specialist	494	4.0	(.9)	201	4.0	(.9)	293	3.9	(.9)	
Meetings with math specialist	486	4.0	(.9)	194	4.1	(.9)	292	3.9	(.9)	
Extra online materials for students to use on their own	553	4.0	(.9)	228	4.0	(1.0)	325	4.0	(.9)	
Special courses	292	3.7	(1.0)	131	3.8	(1.0)	161	3.6	(1.0)	
Technology devices	583	4.4	(.9)	245	4.5	(.9)	338	4.4	(.9)	
Improved Wi-Fi access	579	4.4	(.9)	247	4.5	(.8)	332	4.3	(.9)	
Food assistance	503	4.2	(.9)	227	4.4	(.8)	276	4.1	(.9)	
Behavioral health services	535	4.4	(.8)	218	4.4	(.8)	317	4.4	(.8)	
Other	87	4.3	(1.0)	41	4.4	(.9)	46	4.2	(1.0)	

Please note, these items range from 1-5, with 1 = Much less of a need to 5 = Much more of a need.

#### Table D17. Teacher-reported changes in resources/supports needed by middle school students

Teacher Survey Q27_1r to Q27_11r. Based of	on your experience, h	how much of a need	did your students	have for the following
resources/supports during the pandemic con	ipared to before the <i>j</i>	pandemic? (Middle	school teachers)	

						Distric	t Type			
	Overall			1	Alliance districts			Non-Alliance districts		
	Ν	Mean	(SD)	Ν	Mean	(SD)	Ν	Mean	(SD)	
One-on-one meetings with me	340	3.9	(.9)	111	4.0	(1.0)	229	3.9	(.9)	
Free tutoring (1:1 or small group)	316	3.9	(1.0)	101	3.9	(1.0)	215	3.9	(.9)	
Meetings with reading specialist	240	3.7	(.9)	66	3.9	(1.1)	174	3.7	(.9)	
Meetings with math specialist	239	3.8	(.9)	66	4.0	(1.0)	173	3.8	(.9)	
Extra online materials for students to use on their own	319	3.8	(1.0)	103	3.7	(1.0)	216	3.8	(.9)	
Special courses	217	3.8	(.9)	69	4.0	(.9)	148	3.7	(.9)	
Technology devices	337	4.2	(.9)	112	4.3	(.9)	225	4.2	(1.0)	
Improved Wi-Fi access	332	4.4	(.8)	114	4.5	(.7)	218	4.4	(.8)	
Food assistance	296	4.1	(.9)	108	4.4	(.9)	188	4.0	(.9)	
Behavioral health services	314	4.4	(.8)	105	4.5	(.9)	209	4.4	(.8)	
Other	49	4.2	(.9)	15	4.3	(1.0)	34	4.1	(.9)	

Please note, these items range from 1-5, with 1 = Much less of a need to 5 = Much more of a need.

#### Table D18. Teacher-reported changes in resources/supports needed by high school students

Teacher Survey Q27_1r to Q27_11r. Based on your exper	rience, how much of a need did your students have for the	following
resources/supports during the pandemic compared to before	fore the pandemic? (High school teachers)	

						Distric	t Type		
		Overall		I	Alliance district	ts	No	n-Alliance dist	ricts
	Ν	Mean	(SD)	Ν	Mean	(SD)	Ν	Mean	(SD)
One-on-one meetings with me	522	3.8	(1.0)	149	3.9	(1.1)	373	3.8	(1.0)
Free tutoring (1:1 or small group)	475	3.9	(.9)	134	3.9	(1.0)	341	3.8	(.9)
Meetings with reading specialist	246	3.6	(1.0)	68	3.9	(1.1)	178	3.5	(.9)
Meetings with math specialist	241	3.7	(1.0)	70	4.0	(1.0)	171	3.6	(1.0)
Extra online materials for students to use on their own	471	3.8	(1.0)	132	3.8	(1.0)	339	3.8	(.9)
Special courses	399	4.2	(.9)	128	4.4	(.8)	271	4.2	(.9)
Technology devices	523	4.2	(1.0)	150	4.3	(1.0)	373	4.2	(1.0)
Improved Wi-Fi access	523	4.3	(.9)	149	4.5	(.8)	374	4.3	(.9)
Food assistance	408	4.2	(.8)	135	4.4	(.8)	273	4.1	(.9)
Behavioral health services	453	4.5	(.8)	130	4.6	(.7)	323	4.4	(.8)
Other	78	3.9	(1.1)	27	4.0	(1.1)	51	3.9	(1.1)

Please note, these items range from 1-5, with 1 = Much less of a need to 5 = Much more of a need.

#### Table D19. Teacher-reported changes in resources/supports needed by students (mixed-level)

Teacher Survey Q27\_1r to Q27\_11r. Based on your experience, how much of a need did your students have for the following resources/supports during the pandemic compared to before the pandemic? (Teachers who selected multiple levels, no levels, or "ungraded")

						Distric	t Type		
		Overall			Alliance distric	ts	No	n-Alliance dist	ricts
	Ν	Mean	(SD)	Ν	Mean	(SD)	Ν	Mean	(SD)
One-on-one meetings with me	200	3.9	(1.0)	67	3.9	(1.1)	133	4.0	(1.0)
Free tutoring (1:1 or small group)	183	4.0	(1.0)	66	4.0	(1.0)	117	4.0	(1.0)
Meetings with reading specialist	129	3.8	(1.0)	43	3.8	(1.1)	86	3.8	(.9)
Meetings with math specialist	134	3.9	(1.0)	44	3.9	(1.0)	90	3.8	(.9)
Extra online materials for students to use on their own	185	3.9	(.9)	60	3.7	(1.1)	125	4.0	(.8)
Special courses	133	4.0	(1.0)	47	3.9	(1.0)	86	4.0	(1.0)
Technology devices	198	4.3	(1.0)	66	4.4	(1.0)	132	4.3	(1.0)
Improved Wi-Fi access	198	4.4	(.9)	67	4.6	(.8)	131	4.3	(1.0)
Food assistance	166	4.1	(.9)	59	4.2	(1.0)	107	4.0	(.9)
Behavioral health services	176	4.4	(.9)	61	4.2	(1.1)	115	4.5	(.7)
Other	31	3.8	(1.1)	12	3.7	(1.3)	19	3.8	(1.0)

Please note, these items range from 1-5, with 1 = Much less of a need to 5 = Much more of a need.

Of the approximately 150 teachers who used the "other" open-text option to share resources and supports needed by students during the pandemic, the most common theme was *support for students' social-emotional development*, including an increased focus on social-emotional learning. Many teachers mentioned that students needed connections with teachers and peers, time to socialize with their peers, and opportunities develop their interpersonal skills. Teachers reported that students needed support with mental health and motivation. Many teachers also said their school needed additional staff to support students social-emotionally as well as academically, both during the school day and outside school hours.

In terms of academic learning, teachers reported that students needed additional learning resources, technology support, and modified academic instruction (including smaller class sizes, flexible learning models, re-teaching, and a modified learning pace) to account for the effects of the pandemic. Students also needed help connecting to resources and completing assignments remotely, especially when using unfamiliar devices, platforms, or apps. Other teachers focused on the need for student accountability in the areas of attendance and completion of assignments, to ensure that students were actively participating in their learning. Many teachers reported that increased parental engagement and supervision was necessary for students to be successful with remote instruction. Some teachers talked about the need for more effective behavioral management and discipline during in-person learning, while others described the

importance of routines and structure to help students remain engaged in learning. Other teachers also mentioned the need for hands-on activities, play-based learning, and breaks from constant online instruction.

#### Table D20. Teacher-reported effects of pandemic on students and their families

Teacher survey Q36. Is there anything else you'd like to share about your experiences as a Connecticut teacher during the COVID-19 pandemic?

#### Impacts on Students: Learning/Academic.

Through the open-ended question at the end of the teacher survey, respondents reported substantial learning loss among their students. One teacher commented that, "students covered up their lack of progress/mastery during fully remote that are discovered once we returned to school." Respondents said that students were passed on to the next grade level at the end of the 2019-20 academic year, despite being academically behind by at least one grade level. Another teacher explained "at the high school level, over half the population of our student cannot do basic math or write a grammatically correct sentence." Much of the foundational knowledge required to learn new subject material was forgotten. Students seemed to forget how to be students due to the pandemic, with teachers revealing student difficulty in following classroom routines and poor handwriting skills. At the same time, many teacher survey respondents agreed that students who were dedicated to learning were able to learn throughout the pandemic. Respondents also noted that students became more knowledgeable about technology, which aided student learning. Some teacher survey respondents said that students were more open to trying new learning techniques and exhibited increased patience.

#### Impacts on Students: Effects of pandemic on student conduct/behavior/engagement/work ethic

Of the teachers that responded to the open-ended teacher survey question, the most-reported effect of the pandemic on students was severe behavioral issues. Many teachers shared that students returning to the in-person environment after remote learning lacked empathy, struggled with conflict resolution, and displayed disrespectful and argumentative behavior. Furthermore, many noted that students became increasingly dependent on devices and social media, leading to ongoing digital cheating and a lack of focus and engagement on academic tasks. This lack of focus and motivation was reported frequently by teachers as a result of remote learning. Returning students struggled to acclimate to a structured school environment and were easily distracted, couldn't manage their time, unable to collaborate effectively with others, and unmotivated to perform. This was compounded by a lack of academic accountability that arose during the pandemic and remained in many districts even after the return to fully in-person learning; teachers reported that students were not held accountable for their behavior, and that it bred a lack of academic development and personal responsibility.

According to the end-of-survey open-ended teacher question, some students' engagement, conduct, and/or behavior was positively impacted by the pandemic. For example, some teachers noted that students with special needs or mental health issues participated more freely in the remote environment and performed better without classroom distractions. Furthermore, students became more

technologically literate and flexible in their learning. They had to learn time management skills to complete assignments remotely, they became more willing to try new things, and they learned to collaborate patiently and effectively with other students. Teachers noted that students that were dedicated to their learning excelled during remote instruction.

#### Impacts on Students: Socio-emotional and Interpersonal

Teacher survey respondents commented about increases in several negative emotions, including frustration and anger. Respondents noted that the pandemics made students more socially isolated than in the past. Some respondents stated that students had lost the ability to interact with peers, could not engage in productive conflict resolution, and exhibited poor coping skills. Teachers pointed to students' dependence on technology and social media as reasons for underdeveloped interpersonal skills. One teacher noted "students lack more empathy ... There are constant bullying, fights, and crying students with drama." Teachers observed a mismatch between students' grade level and maturity level, with many referencing teaching students behaving 2-3 years below their grade level. In addition, many respondents commented about the number of students who experienced severe mental health crises during the pandemic, including depression and anxiety. One teacher said they "had more students hospitalized for psych issues in the last 2 years than in the previous 14 combined."

#### Impacts on Parents: Family Engagement and Support

In their responses to the open-ended question at the end of the teacher survey, teachers expressed concern about inadequate parental involvement and supervision of student's learning during the pandemic. Respondents noted that parents' work obligations affected the extent to which students participated in school. One teacher said, "Work and food were top priorities. Schoolwork was not." Language barriers made it difficult for some parents to engage with teachers or help their children with schoolwork. Teachers also noted that some parents took advantage of the lenient attendance policies, allowing their children to stay home and learn remotely even when they had the ability to attend in-person classes. Teachers also described an unexpected benefit of remote and hybrid learning: the pandemic exposed parents to what a school day is like, garnering more appreciation for teachers and more recognition of the importance of parent involvement in students' academics. Remote learning also provided opportunities for teachers to connect with parents in ways that hadn't been possible previously. Overall, actively involved parents supported remote learning and made teachers feel more connected to their students.

#### Impacts on Students: Family Relationships & Responsibilities

Finally, teacher survey respondents noted that their students experienced an array of family situations that impacted learning and school engagement. Many teachers saw students taking on parent/caregiver roles. One teacher explained that some "students became sole breadwinners of their families. Others had to take care of younger siblings while parents or guardians juggled whatever jobs they

could find. Survival came first, schoolwork second." Some respondents noted that for some students who had family obligations, online learning formats were beneficial.

#### Impacts on Students: Services for Special Education Students

Via the open-ended question at the end of the teacher survey, teachers expressed concern about the lack of resources for teachers to use with students' emerging needs for learning support. Some students who might qualify for special education services, including Birth to Three, were not assessed because of the pandemic. Respondents also voiced a need for more teacher training in special education, along with increased access to intervention services and support to help teachers meet Individualized Education Program (IEP) accommodations.

#### Impacts on Students: Services for English Learner Students

Similarly, responses to the open-ended teacher survey question indicated that ESL services were minimal or nonexistent during the pandemic, which made it difficult for English Learner students to engage with classroom material.

# Research Question 2b. What technological and other resources did districts provide to support student learning during the pandemic, and what technology challenges did students experience?

### **Table D21. District-reported access to electronic devices for elementary school students prior to the COVID-19 pandemic**

District Inventory: Q4\_7e - Q4\_9e. Which of the following accurately describes the following learning opportunities for your district's elementary school students prior to the COVID-19 pandemic (before March 2020)? Please select all that apply.

_					Distri	ct Type		
	Ov	erall	Alliance	e districts	Non-Allia	nce districts	AP	SEPs
	Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid
	Count	Percent	Count	Percent	Count	Percent	Count	Percent
Each student had access to a school-provided	134	69.4	25	78.1	92	70.8	17	54.8
device for use in school as needed for class (e.g.,								
Chromebook cart)								
Each student had a personal school-provided	35	18.1	5	15.6	27	20.8	3	9.7
device for use at home or school								
Each student could bring their own device or	29	15.0	4	12.5	17	13.1	8	25.8
select to use a school-provided device								
None of the above	51	26.4	7	21.9	31	23.8	13	41.9
Total N	193	100.0	32	100.0	130	100.0	31	100.0

#### Table D22. District-reported mean percentage of elementary students with access to digital devices as of March 1, 2020.

District Inventory Q41.1e. Please estimate the percentage of elementary students who had access to digital devices at home as of March 1, 2020.

								District Type	e			
		Overall		A	Alliance distric	ets	Nor	-Alliance dis	tricts		APSEPs	
_		Mean			Mean			Mean			Mean	
	N*	Percent	(SD)	N*	Percent	(SD)	N*	Percent	(SD)	N*	Percent	(SD)
Chromebooks, laptops, or iPads provided by the district	170	60.1	(38.6)	24	56.7	(43.3)	116	61.9	(39.3)	30	56.0	(32.0)
Chromebooks, laptops, or iPads provided by the student/family	156	49.5	(29.8)	27	35.6	(27.8)	98	54.4	(29.4)	31	46.1	(29.4)
Smartphones only	84	33.1	(27.5)	16	45.6	(26.3)	55	27.1	(23.4)	13	43.1	(37.5)
No mobile device	66	18.3	(21.3)	12	30.0	(29.5)	44	15.0	(19.5)	10	19.0	(12.9)

#### Table D23. District-reported mean percentage of elementary students with access to digital devices as of May 1, 2020

District Inventory: Q41.2e. Please estimate the percentage of elementary students who had access to digital devices at home as of May 1, 2020.

		Overall Alliance districts					District Type					
		Overall		A	Alliance distrie	ets	Nor	n-Alliance dis	tricts		APSEPs	
		Mean			Mean			Mean		Mean		
	N*	Percent	(SD)	N*	Percent	(SD)	N*	Percent	(SD)	N*	Percent	(SD)
Chromebooks, laptops, or iPads provided by the district	194	87.2	(21.4)	33	88.5	(18.7)	129	87.7	(22.2)	32	83.8	(21.1)
Chromebooks, laptops, or iPads provided by the student/family	163	50.5	(30.7)	31	32.9	(28.2)	101	56.2	(29.8)	31	49.4	(30.3)
Smartphones only	62	21.3	(26.1)	16	29.4	(32.1)	37	16.8	(21.2)	9	25.6	(31.3)
No mobile device	39	14.6	(20.2)	8	23.7	(27.2)	26	13.5	(19.2)	5	6.0	(5.5)

\*District response rates were sometimes low for these questions, and it is unclear if the response should have been a "no", is truly missing, or that districts did not know. Please note, mean percent describes the mean of each participating district's reported value.

**Table D24.** District-reported mean percentage of elementary students with access to digital devices as of November 1, 2020 *District Inventory Q41.3e. Please estimate the percentage of elementary students who had access to digital devices at home as of November 1, 2020.* 

		Overall Alliance districts					District Type					
		Overall		A	Alliance distric	ets	Nor	n-Alliance dis	tricts		APSEPs	
		Mean			Mean			Mean		Mean		
	N*	Percent	(SD)	N*	Percent	(SD)	N*	Percent	(SD)	N*	Percent	(SD)
Chromebooks, laptops, or iPads provided by the district	193	94.6	(15.5)	32	98.1	(4.7)	130	95.2	(15.6)	31	88.4	(20.3)
Chromebooks, laptops, or iPads provided by the student/family	162	51.6	(31.2)	31	34.8	(27.6)	100	58.0	(30.3)	31	47.7	(31.4)
Smartphones only	44	25.5	(30.5)	11	36.4	(33.2)	25	18.0	(23.6)	8	33.8	(41.7)
No mobile device	29	13.8	(20.9)	7	25.7	(28.8)	18	11.1	(18.4)	4	5.0	(5.8)

#### **Table D25. District-reported access to electronic devices middle school students prior to the COVID-19 pandemic** *District Inventory:* Q4\_7m - Q4\_9m. *Which of the following accurately describes the following learning opportunities for your district's middle school students prior to the COVID-19 pandemic (before March 2020)? Please select all that apply.*

					Distri	ct Type		
	Ov	rerall	Alliance	e districts	Non-Allia	nce districts	AP	SEPs
	Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid
	Count	Percent	Count	Percent	Count	Percent	Count	Percent
Each student had access to a school-provided device for use in school as needed for class (e.g., Chromebook cart)	146	77.2	25	80.6	99	81.1	22	61.1
Each student had a personal school-provided device for use at home or school	74	39.2	10	32.3	59	48.4	5	13.9
Each student could bring their own device or select to use a school-provided device	57	30.2	6	19.4	40	32.8	11	30.6
None of the above	32	16.9	5	16.1	15	12.3	12	33.3
Total N	189	100.0	31	100.0	122	100.0	36	100.0

#### Table D26. District-reported mean percentage of middle school students with access to digital devices as of March 2020

District Inventory Q41.1m. Please estimate the percentage of middle school students who had access to digital devices at home as of March 1, 2020.

	District Type           Overall         Alliance districts											
		Overall		A	Alliance distric	ets	Nor	n-Alliance dis	tricts		APSEPs	
-		Mean			Mean			Mean			Mean	
	N*	Percent	(SD)	N*	Percent	(SD)	N*	Percent	(SD)	N*	Percent	(SD)
Chromebooks, laptops, or iPads provided by the district	176	70.2	(36.7)	26	62.3	(40.7)	114	76.2	(35.1)	36	56.9	(35.0)
Chromebooks, laptops, or iPads provided by the student/family	143	48.7	(32.0)	22	36.8	(27.8)	89	54.2	(33.1)	32	41.9	(28.3)
Smartphones only	68	37.1	(31.0)	16	54.4	(29.7)	39	29.7	(27.1)	13	37.7	(36.8)
No mobile device	47	18.3	(21.1)	9	16.7	(17.3)	28	19.3	(24.3)	10	17.0	(14.9)

#### Tables D27. District-reported mean percentage of middle school students with access to digital devices as of May 2020

District Inventory Q41.2m. Please estimate the percentage of middle school students who had access to digital devices at home as of May 1, 2020.

		Overall Alliance districts					District Type					
		Overall		A	Alliance distrie	ets	Nor	n-Alliance dis	tricts		APSEPs	
		Mean			Mean			Mean		Mean		
	N*	Percent	(SD)	N*	Percent	(SD)	N*	Percent	(SD)	N*	Percent	(SD)
Chromebooks, laptops, or iPads provided by the district	192	87.7	(22.8)	31	89.7	(17.2)	123	89.5	(21.9)	38	80.3	(27.9)
Chromebooks, laptops, or iPads provided by the student/family	144	50.9	(32.1)	23	37.4	(26.7)	89	55.8	(33.4)	32	46.9	(29.5)
Smartphones only	43	28.6	(33.4)	12	44.2	(38.7)	22	22.3	(29.1)	9	23.3	(32.4)
No mobile device	30	14.0	(19.2)	9	10.0	(7.1)	16	18.1	(25.4)	5	8.0	(4.5)

\*District response rates were sometimes low for these questions, and it is unclear if the response should have been a "no", is truly missing, or that districts did not know. Please note, mean percent describes the mean of each participating district's reported value.

#### Tables D28. District-reported mean percentage of middle school students with access to digital devices as of Nov 2020

District Inventory Q41.3m. Please estimate the percentage of middle school students who had access to digital devices at home as off November 1, 2020.

_	District Type Overall Alliance districts Non-Alliance dist											
		Overall		A	Alliance distric	ets	Nor	n-Alliance dis	tricts		APSEPs	
-		Mean			Mean			Mean			Mean	
	N*	Percent	(SD)	N*	Percent	(SD)	N*	Percent	(SD)	N*	Percent	(SD)
Chromebooks, laptops, or iPads provided by	192	93.0	(18.9)	31	97.7	(5.0)	124	94.2	(17.3)	37	84.9	(27.7)
the district Chromebooks, laptops, or iPads provided by the student/family	144	51.7	(32.9)	23	40.4	(27.4)	89	57.0	(34.2)	32	45.3	(30.4)
Smartphones only	31	35.8	(38.0)	9	56.7	(36.7)	15	22.7	(32.2)	7	37.1	(43.9)
No mobile device	26	11.9	(19.2)	8	10.0	(5.3)	13	15.4	(26.7)	5	6.0	(5.5)

#### Table D29. District-reported access to electronic devices for high school students prior to the COVID-19 pandemic

*District Inventory:* Q4\_7h - Q4\_9h. Which of the following accurately describes the following learning opportunities for your district's high school students prior to the COVID-19 pandemic (before March 2020)? Please select all that apply.

					Distri	et Type		
	Ov	erall	Alliance	e districts	Non-Allia	nce districts	AP	SEPs
	Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid
	Count	Percent	Count	Percent	Count	Percent	Count	Percent
Each student had access to a school-provided device for use in school as needed for class (e.g., Chromebook cart)	124	71.7	24	80.0	75	74.3	25	59.5
Each student had a personal school-provided device for use at home or school	78	45.1	16	53.3	54	53.5	8	19.0
Each student could bring their own device or select to use a school-provided device	80	46.2	9	30.0	56	55.4	15	35.7
None of the above	26	15.0	4	13.3	10	9.9	12	28.6
Total N	173	100.0	30	100.0	101	100.0	42	100.0

#### Table D30. District-reported mean percentage high school students with access to digital devices as of March 2020

District Inventory Q41.1h. Please estimate the percentage of high school students who had access to digital devices at home as of March 1, 2020.

	Overall Alliance districts					District Type						
		Overall		A	Alliance distric	ets	Nor	n-Alliance dis	tricts		APSEPs	
-		Mean			Mean			Mean			Mean	
	N*	Percent	(SD)	N*	Percent	(SD)	N*	Percent	(SD)	N*	Percent	(SD)
Chromebooks, laptops, or iPads provided by the district	165	71.9	(37.5)	27	67.0	(37.5)	96	77.2	(36.1)	42	63.1	(39.3)
Chromebooks, laptops, or iPads provided by the student/family	131	50.6	(33.7)	21	35.7	(24.4)	76	55.1	(35.1)	34	49.7	(33.4)
Smartphones only	60	34.3	(32.9)	15	60.0	(34.8)	29	26.9	(29.7)	16	23.8	(24.5)
No mobile device	39	12.1	(12.8)	6	11.7	(11.7)	20	12.5	(14.8)	13	11.5	(10.7)

#### Table D31. District-reported mean percentage high school students with access to digital devices as of May 2020

District Inventory Q41.2h. Please estimate the percentage of high school students who had access to digital devices at home as of May 1, 2020.

	District Type											
		Overall		Alliance districts			Non-Alliance districts			APSEPs		
		Mean		Mean			Mean			Mean		
	N*	Percent	(SD)	N*	Percent	(SD)	N*	Percent	(SD)	N*	Percent	(SD)
Chromebooks, laptops, or iPads provided by the district	180	86.7	(25.7)	31	92.5	(12.9)	105	89.3	(24.2)	44	76.4	(32.6)
Chromebooks, laptops, or iPads provided by the student/family	133	52.0	(33.7)	22	35.5	(23.9)	76	56.3	(35.1)	35	53.1	(33.2)
Smartphones only	38	32.9	(36.2)	10	53.0	(41.1)	15	29.3	(34.5)	13	21.5	(30.0)
No mobile device	28	10.7	(8.6)	6	11.7	(7.5)	15	10.7	(9.6)	7	10.0	(8.2)

\*District response rates were sometimes low for these questions, and it is unclear if the response should have been a "no", is truly missing, or that districts did not know. Please note, mean percent describes the mean of each participating district's reported value.

#### Table D32. District-reported mean percentage high school students with access to digital devices as of Nov 2020

District Inventory Q41.3h. Please estimate the percentage of high school students who had access to digital devices at home as of November 1, 2020.

	District Type											
		Overall		Alliance districts			Non-Alliance districts			APSEPs		
				Mean			Mean			Mean		
	N*	Mean Percent	(SD)	N*	Percent	(SD)	N*	Percent	(SD)	N*	Percent	(SD)
Chromebooks, laptops, or iPads provided by the district	179	91.2	(22.4)	31	98.1	(4.8)	105	91.0	(23.0)	43	86.7	(27.4)
Chromebooks, laptops, or iPads provided by the student/family	133	52.7	(33.6)	22	38.6	(24.9)	76	56.6	(35.3)	35	53.1	(33.1)
Smartphones only	31	38.7	(39.1)	8	63.7	(38.9)	13	33.1	(39.0)	10	26.0	(33.1)
No mobile device	25	8.8	(8.3)	6	8.3	(4.1)	13	9.2	(10.4)	6	8.3	(7.5)

		District Type							
		Ov	erall	Alliance	e districts	Non-Allia	nce districts		
		Valid	Valid	Valid	Valid	Valid	Valid		
		Count	Percent	Count	Percent	Count	Percent		
Elementary school	Extremely inadequate	71	11.5	47	17.8	24	6.8		
	Somewhat inadequate	80	13.0	44	16.7	36	10.2		
	Neither adequate nor inadequate	21	3.4	8	3.0	13	3.7		
	Somewhat adequate	155	25.1	75	28.4	80	22.7		
	Extremely adequate	290	47.0	90	34.1	200	56.7		
	Total N	617	100.0	264	100.0	353	100.0		
Middle school	Extremely inadequate	25	6.8	12	10.2	13	5.2		
	Somewhat inadequate	35	9.5	16	13.6	19	7.6		
	Neither adequate nor inadequate	8	2.2	2	1.7	6	2.4		
	Somewhat adequate	89	24.1	31	26.3	58	23.1		
	Extremely adequate	212	57.5	57	48.3	155	61.8		
	Total N	369	100.0	118	100.0	251	100.0		
High school	Extremely inadequate	42	7.3	21	11.8	21	5.3		
	Somewhat inadequate	64	11.1	28	15.7	36	9.1		
	Neither adequate nor inadequate	26	4.5	6	3.4	20	5.1		
	Somewhat adequate	158	27.5	53	29.8	105	26.5		
	Extremely adequate	284	49.5	70	39.3	214	54.0		
	Total N	574	100.0	178	100.0	396	100.0		
Multiple levels,	Extremely inadequate	16	7.9	11	16.9	5	3.6		
ungraded, or	Somewhat inadequate	26	12.8	7	10.8	19	13.8		
unknown	Neither adequate nor inadequate	10	4.9	5	7.7	5	3.6		
	Somewhat adequate	50	24.6	23	35.4	27	19.6		
	Extremely adequate	101	49.8	19	29.2	82	59.4		
	Total N	203	100.0	65	100.0	138	100.0		

#### Table D33. Teacher-reported access to 1:1 devices for students by grade level: spring 2020

Teacher Survey Q19\_1a. How adequate was your access to 1:1 devices for students in spring 2020?

		District Type							
		Ov	erall	Alliance	e districts	Non-Allia	nce districts		
		Valid	Valid	Valid	Valid	Valid	Valid		
		Count	Percent	Count	Percent	Count	Percent		
Elementary school	Extremely inadequate	21	3.3	10	3.7	11	3.0		
	Somewhat inadequate	28	4.4	19	7.0	9	2.5		
	Neither adequate nor inadequate	16	2.5	5	1.8	11	3.0		
	Somewhat adequate	121	18.9	65	23.8	56	15.3		
	Extremely adequate	453	70.9	174	63.7	279	76.2		
	Total N	639	100.0	273	100.0	366	100.0		
Middle school	Extremely inadequate	4	1.0	3	2.4	1	.4		
	Somewhat inadequate	15	3.9	8	6.5	7	2.7		
	Neither adequate nor inadequate	9	2.4	5	4.1	4	1.6		
	Somewhat adequate	61	16.0	21	17.1	40	15.5		
	Extremely adequate	292	76.6	86	69.9	206	79.8		
	Total N	381	100.0	123	100.0	258	100.0		
High school	Extremely inadequate	13	2.3	6	3.4	7	1.8		
	Somewhat inadequate	21	3.7	12	6.8	9	2.3		
	Neither adequate nor inadequate	19	3.3	9	5.1	10	2.5		
	Somewhat adequate	119	20.8	39	22.0	80	20.3		
	Extremely adequate	400	69.9	111	62.7	289	73.2		
	Total N	572	100.0	177	100.0	395	100.0		
Multiple levels,	Extremely inadequate	2	.9	2	3.0	0	.0		
ungraded, or	Somewhat inadequate	9	4.3	4	6.0	5	3.5		
unknown	Neither adequate nor inadequate	7	3.3	4	6.0	3	2.1		
	Somewhat adequate	53	25.1	24	35.8	29	20.1		
	Extremely adequate	140	66.4	33	49.3	107	74.3		
	Total N	211	100.0	67	100.0	144	100.0		

# Table D34. Teacher-reported access to 1:1 devices for students by grade level: school year 2020-21Teacher Survey Q19\_1a. How adequate was your access to 1:1 devices for students in 2020-21?

# Table D35. District-reported changes over time in the mean percent of students with sufficient internet access to participate in online learning

District Inventory: Q23. Please provide your best guess for what percentage of students had sufficient internet access for full participation in online learning as of the following dates.

_	District Type												
_		Overall		А	Iliance distri	ets	Non	-Alliance dis	tricts	APSEPs			
_	Mean			Mean			Mean			Mean			
	Ν	Percent	(SD)	Ν	Percent	(SD)	Ν	Percent	(SD)	Ν	Percent	(SD)	
March 1, 2020	217	78.8	(19.5)	29	69.0	(25.3)	140	82.7	(14.4)	48	73.3	(24.8)	
May 1, 2020	220	88.4	(14.7)	32	79.5	(18.4)	140	91.0	(11.3)	48	86.5	(18.3)	
November 1, 2020	219	94.5	(10.0)	32	93.0	(9.1)	139	96.3	(5.7)	48	90.2	(16.8)	

Please note, Mean Percent describes the mean of each participating district's reported value.

## Table D36. District-reported changes over time in the mean percent of students who would have had sufficient internet access for full participation in online learning without district action

District Inventory: Q25. Please provide your best guess for what percentage of students would have had sufficient internet access for full participation in online learning as of the following dates without district action.

		District Type												
		Overall		Alliance districts			Nor	n-Alliance dist	ricts		APSEPs			
		Mean		Mean				Mean			Mean			
	Ν	Percent	(SD)	Ν	Percent	(SD)	Ν	Percent	(SD)	Ν	Percent	(SD)		
March 1, 2020	216	76.1	(20.2)	29	63.8	(23.7)	139	79.8	(17.0)	48	72.7	(23.1)		
May 1, 2020	220	78.5	(20.8)	32	63.4	(25.4)	140	81.8	(18.1)	48	79.0	(21.2)		
November 1, 2020	219	81.0	(20.2)	32	65.9	(26.3)	139	84.4	(17.0)	48	81.2	(19.9)		

Please note, mean percent describes the mean of each participating district's reported value.

#### Table D37. District-reported efforts to improve internet access in students' homes

District Inventory: Q24. Describe what your district has done since the beginning of the pandemic, if anything, to improve internet access in students' homes.

Following the transition to remote learning, school districts worked to ensure that all students had adequate internet access to participate. As reported by 122 districts, the primary method of doing so was to purchase and provide mobile hotspots for students that needed them. The specific program mentioned most often was a collaboration with the company Kajeet, which aided in providing

mobile hotspots to households in need. Some districts reported that although they had hotspots available, there wasn't a great need for them, and many were never used. Another way that districts contributed to increasing internet connectivity was through collaboration with local companies and programs, an effort that was communicated by 64 districts. Districts made use of CT state programs, such as the Everybody Learns initiative, to increase their students' connectivity and engagement. Another common strategy was collaboration with cable/internet providers, including but not limited to Xfinity, Charter, Optimum, Atlantic Broadband, Spectrum, and more. An additional area of interest was increasing the amount of public Wi-Fi areas within the district's domain for students that didn't have and couldn't get Wi-Fi in their homes. Schools also provided waivers for free or low-cost internet to students, and districts made sure to share information about the availability of free or low-cost internet programs. Despite these resources, there were several districts that discussed barriers to access. Some homes were too far into rural areas to be connected to the internet or covered by cell service. Some families who lacked internet access did not qualify for support. In addition to efforts to increase students' internet access, districts also contributed other resources to support remote learning. There were 14 districts that mentioned they provided devices for students, primarily Chromebooks, to ensure that they could have a 1:1 connection with students.

#### Table D38. Teacher-reported technology challenges

Teacher survey Q36. Is there anything else you'd like to share about your experiences as a Connecticut teacher during the COVID-19 pandemic?

Teacher survey respondents indicated a variety of concerns about student access to technology through the open-ended question at the end of the survey. Some teachers said that students had access to outdated computers or no access to computers making it difficult for students to learn. Teachers reported that unreliable internet connections also negatively impacted the student experience. Respondents noted that learning how to use new technology was especially difficult for younger students, with many teachers stating that teaching students to use technology took time away from teaching curriculum material. Other teachers raised concerns about the long-term effect of students' inappropriate use of technology to do their homework. One teacher stated that technology was affecting "students no longer have the patience nor the motivation to engage with curriculum on a deeper and more meaningful level." While this teacher believes there are benefits to using technology for student learning, they caution that "an over-reliance on using computers in the classroom and at home ... incentivizes cheating, depersonalizes instruction, promotes distractions and precipitates social/emotional anxiety." Other teachers reported that school districts provided students with adequate computers and ensured they had free internet access when needed. Some respondents said that students learned how to use a variety of technologies to engage with academic material.

### Research Question 2c. What resources were available to support students' physical and emotional wellbeing during the pandemic, compared to before the pandemic?

#### Table D39. District-reported availability of free meals by grade level prior to the COVID-19 pandemic

District Inventory: Q4\_10emh. For which of the following grade levels did your district offer free meals to all students prior to the COVID-19 pandemic (before March 2020)? Please select all that apply.

	District Type										
	Ov	erall	Alliance	e districts	Non-Allia	nce districts	APSEPs				
	Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid			
	Count	Percent	Count	Percent	Count	Percent	Count	Percent			
Elementary school	65	29.4	27	84.4	26	18.3	12	25.5			
Middle school	64	29.0	25	78.1	25	17.6	14	29.8			
High School	58	26.2	22	68.8	18	12.7	18	38.3			
None of the above/Not applicable	145	65.6	5	15.6	112	78.9	28	59.6			
Total N	221	100.0	32	100.0	142	100.0	47	100.0			

#### Table D40. District-reported strategies for providing nutrition support to students during spring 2020

District Inventory: Q11. During spring 2020, which of the following strategies, if any, did your district use to provide nutrition support for students?

	District Type								
	Overall		Alliance	e districts	Non-Allia	nce districts	APSEPs		
_	Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	
Offered free take-away meals to all students	156	71.2	30	93.8	122	87.8	4	8.3	
Delivered school meals or groceries to students' homes	75	34.2	19	59.4	46	33.1	10	20.8	
Supported enrollment in TANIF, etc.	11	5.0	3	9.4	7	5.0	1	2.1	
Other (please describe):	36	16.4	4	12.5	16	11.5	16	33.3	
None of the above	23	10.5	0	.0	1	.7	22	45.8	
Total N	219	100.0	32	100.0	139	100.0	48	100.0	

The 36 districts that used the open-text option to describe "other" strategies they used to provide nutrition support to students during spring 2020 emphasized collaboration and referrals. Some districts used this open-text option to note that they were providing free take-away meals for those students eligible for free and reduced meals, rather than for all students. Some districts reported that they

offered grocery pickup or collaborated with food pantries or with other local towns and districts that were distributing food. When districts were not providing nutrition themselves, they often referred students and families to other programs available in the community; this was particularly common among APSEPs, RESCs, and charter districts.

Table D41. District-reported strategies for providing nutrition support to students during the 2020-21 school year
District Inventory: Q19. During the 2020-21 school year, which of the following strategies, if any, did your district use to provide
nutrition support for students?

_	District Type									
	Ov	erall	Alliance	e districts	Non-Alliance districts		APSEPs			
	Valid Valid		Valid	Valid	Valid	Valid	Valid	Valid		
	Count	Percent	Count	Percent	Count	Percent	Count	Percent		
Offered free in-school meals to all students	177	81.6	31	96.9	126	92.0	20	41.7		
Offered free take-away meals to all students	104	47.9	25	78.1	77	56.2	2	4.2		
Offered free take-away meals to students who were learning remotely	135	62.2	30	93.8	103	75.2	2	4.2		
Delivered school meals or groceries to students' homes	54	24.9	16	50.0	33	24.1	5	10.4		
Supported enrollment in TANIF, etc.	14	6.5	4	12.5	9	6.6	1	2.1		
Other (please describe):	26	12.0	2	6.3	8	5.8	16	33.3		
None of the above	19	8.8	0	.0	3	2.2	16	33.3		
Total N	217	100.0	32	100.0	137	100.0	48	100.0		

The 26 districts that used the open-text option to describe "other" strategies they used to provide nutrition support to students during the 2020-21 school year provided a variety of responses. Just as in the spring of 2020, some districts mentioned they only provided free meals to students that qualified for free and reduced meals, not all students. As in the spring, several districts reported that they collaborated with local food pantries to provide for their families. Some districts emphasized creative or unique methods of ensuring nutrition support for students. For example, one district reported that bus stops throughout the city were used to deliver meals to students as they attended school from home. Another district reported that they gave students breakfast foods to take home and eat before coming to school because the district couldn't ensure adequate social distancing for students to eat breakfast at school.

#### Table D42. District-reported allocation of resources for social services referrals in spring 2020

District Inventory: Q12. In spring 2020, how did your district's allocation of resources for referrals to social services (for example, physical or behavioral health care, nutrition assistance, housing assistance) compare to before the pandemic?

		District Type										
	Ov	erall	Alliance	e districts	Non-Allia	nce districts	APSEPs					
	Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid				
	Count	Percent	Count	Percent	Count	Percent	Count	Percent				
Allocated a lot less resources	6	2.7	1	3.1	4	2.9	1	2.0				
Allocated somewhat less resources	16	7.2	3	9.4	10	7.2	3	6.0				
Allocated a similar amount of resources	121	54.8	12	37.5	77	55.4	32	64.0				
Allocated somewhat more resources	53	24.0	11	34.4	34	24.5	8	16.0				
Allocated a lot more resources	25	11.3	5	15.6	14	10.1	6	12.0				
Total N	221	100.0	32	100.0	139	100.0	50	100.0				

#### Table D43. District-reported number of social services referrals in spring 2020

District Inventory: Q13. In spring 2020, how did the number of students referred for social services (for example, physical or behavioral health care, nutrition assistance, housing assistance) compare to before the pandemic?

		District Type											
	Ov	erall	Alliance	e districts	Non-Allia	nce districts	APSEPs						
	Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid					
	Count	Percent	Count	Percent	Count	Percent	Count	Percent					
A lot fewer students	15	6.9	1	3.1	11	8.0	3	6.1					
Somewhat fewer students	22	10.1	9	28.1	10	7.3	3	6.1					
About the same number of students	106	48.6	4	12.5	67	48.9	35	71.4					
Somewhat more students	56	25.7	14	43.8	39	28.5	3	6.1					
A lot more students	19	8.7	4	12.5	10	7.3	5	10.2					
Total N	218	100.0	32	100.0	137	100.0	49	100.0					

#### Table D44. District-reported efforts to connect students to social services in spring 2020

District Inventory: Q14. During spring 2020, what was your district doing to connect students to social services agencies?

Districts reported that their efforts to connect students to social services in the spring of 2020 typically involved following their normal processes, but with an increase in personal outreach from staff to students and families due to the shift to virtual learning. For example, referrals conducted through 211 and referrals to outside agencies followed the typical processes. There were 38 districts that mentioned collaborations with local agencies, especially with their local youth and family services agency. To maintain mental health services during this period, a number of districts reported that they partnered with local agencies for mental health and medical support or supported students through school-based health centers and clinicians; virtual services like telehealth appointments were made available in many cases. That being said, four districts explicitly noted that due to the pandemic, social services in their area were limited as a result of local agencies being closed or only offering minimal services. In terms of informing students and families about available resources, 29 districts reported that they conducted active personal outreach to their students and families and 11 reported passive personal outreach, such as robocalls, email newsletters, and resources listed on the district website. Active outreach was a commonly mentioned strategy for maintaining personal connections with students and families; many districts utilized teachers, counselors, and social workers to directly email and call students and families (especially for disengaged or absent students) and ensure that they were connected to the appropriate resources. Some districts (11 responses) indicated that social workers and counselors attempted to carry out home visits to students that were disengaged, while other districts reported that home visits were not feasible due to health concerns and unwilling families. For the spring of 2020, several districts mentioned that the COVID-19 shutdowns made it challenging for students to access social services.

#### Table D45. District-reported allocation of resources for social services referrals in school year 2020-21

District Inventory: Q20. During the 2020-21 school year, how did your district's allocation of resources for referrals to social services (for example, physical or behavioral health care, nutrition assistance, housing assistance) compared to spring 2020?

	District Type									
	Ov	erall	Alliance	Alliance districts		nce districts	APSEPs			
	Valid Valid		Valid	Valid	Valid	Valid	Valid	Valid		
	Count	Percent	Count	Percent	Count	Percent	Count	Percent		
Allocated a lot less resources	1	.5	1	3.2	0	.0	0	.0		
Allocated somewhat less resources	3	1.4	0	.0	0	.0	3	6.1		
Allocated a similar amount of resources	94	43.7	7	22.6	53	39.3	34	69.4		
Allocated somewhat more resources	89	41.4	15	48.4	66	48.9	8	16.3		
Allocated a lot more resources	28	13.0	8	25.8	16	11.9	4	8.2		
Total N	215	100.0	31	100.0	135	100.0	49	100.0		

#### Table D46. District-reported number of social services referrals in school year 2020-21

District Inventory: Q21. During the 2020-21 school year, how did the number of students referred for social services (for example, physical or behavioral health care, nutrition assistance, housing assistance) compare to spring 2020?

		District Type									
	Overall		Alliance districts		Non-Alliance districts		APSEPs				
	Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid			
	Count	Percent	Count	Percent	Count	Percent	Count	Percent			
A lot fewer students	2	.9	1	3.2	0	.0	1	2.0			
Somewhat fewer students	4	1.9	1	3.2	2	1.5	1	2.0			
About the same number of students	78	36.1	6	19.4	35	25.7	37	75.5			
Somewhat more students	97	44.9	14	45.2	77	56.6	6	12.2			
A lot more students	35	16.2	9	29.0	22	16.2	4	8.2			
Total N	216	100.0	31	100.0	136	100.0	49	100.0			

#### Table D47. District-reported efforts to connect students to social services during school year 2020-21

District Inventory: Q22. During the 2020-21 school year, what was your district doing to connect students to social services agencies?

Via the district inventory, districts reported that 2020-21 school year efforts to connect students to social services were largely focused on mental health support and often relied on individualized outreach. For example, 47 districts reported collaborating with or making referrals to local social service agencies. Districts reported a heightened emphasis on implementing school-based mental healthcare on the school level and partnering with local mental health support agencies at the district level. Districts reported that mental health services were embedded within the school system in the form of counseling teams, mental health clinicians, and school-based health centers. Whereas the COVID-19 shutdowns made it challenging for students to access social services in the spring of 2020, districts reported that limited resources available in rural areas of Connecticut were the main barrier to access to social services during the 2020-21 school year. Districts that discussed referrals stressed the importance of social workers, teachers, and counselors maintaining active communications and individual connections with students, and then using existing processes to refer them to any necessary services. In terms of the dissemination of information about available resources, districts reported that beyond sharing information through newsletters and the district and school websites, they asked teachers, counselors, and social workers to actively seek out students that they thought needed additional support and personally reach out to students and families, sometimes even daily. There were 12 districts that mentioned conducting home visits. In general, home visits were completed primarily by school social workers and counselors. Some districts reported that they increased home visits during this time period, and some reported issues with conducting home visits, such as concerns for health or unwillingness from the family.

#### Table D48. District-reported changes by grade level in students' participation in counseling meetings

District Inventory: Q46emh\_1r. To the best of your knowledge, how common were counseling meetings (e.g., virtual or in-person meetings of counselors, social workers, or therapists and students to provide mental health services) with students from the following grade levels during the pandemic, compared to before the pandemic?

						Distric	rt Type		
		Ove	erall	Alliance	e districts	Non-Allia	nce districts	APS	SEPs
		Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid
		Count	Percent	Count	Percent	Count	Percent	Count	Percent
Elementary	Much less common	2	1.1	0	.0	0	.0	2	6.9
School	Somewhat less common	13	7.0	1	3.1	9	7.2	3	10.3
	About the same	73	39.2	10	31.3	46	36.8	17	58.6
	Somewhat more common	65	34.9	14	43.8	46	36.8	5	17.2
	Much more common	33	17.7	7	21.9	24	19.2	2	6.9
	Total N	186	100.0	32	100.0	125	100.0	29	100.0
Middle School	Much less common	2	1.1	0	.0	0	.0	2	5.9
	Somewhat less common	8	4.5	2	6.5	4	3.5	2	5.9
	About the same	64	35.8	10	32.3	35	30.7	19	55.9
	Somewhat more common	63	35.2	10	32.3	46	40.4	7	20.6
	Much more common	42	23.5	9	29.0	29	25.4	4	11.8
	Total N	179	100.0	31	100.0	114	100.0	34	100.0
High School	Much less common	1	.6	0	.0	0	.0	1	2.4
	Somewhat less common	9	5.4	2	6.7	4	4.2	3	7.3
	About the same	54	32.3	10	33.3	24	25.0	20	48.8
	Somewhat more common	60	35.9	9	30.0	40	41.7	11	26.8
	Much more common	43	25.7	9	30.0	28	29.2	6	14.6
	Total N	167	100.0	30	100.0	96	100.0	41	100.0

#### Table D49. District-reported SEL programs/approaches used by elementary schools during 2019-20 and 2020-21

District Inventory: Q47e\_1. What social and emotional learning (SEL) program/approach were your elementary schools using, if any, during the following school years?

	_					Distri	ct Type		
		Ove	erall	Alliance	e districts	Non-Allia	nce districts	APS	SEPs
		Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid
		Count	Percent	Count	Percent	Count	Percent	Count	Percent
2019-20	4Rs	2	1.1	1	3.0	0	.0	1	3.8
	MindUp	5	2.8	0	.0	5	4.1	0	.0
	PATHS	1	.6	0	.0	1	.8	0	.0
	PBIS	102	56.4	25	75.8	63	51.6	14	53.8
	Responsive Classroom	84	46.4	14	42.4	66	54.1	4	15.4
	<b>Restorative Practices</b>	78	43.1	17	51.5	50	41.0	11	42.3
	RULER	49	27.1	14	42.4	35	28.7	0	.0
	Second Step	85	47.0	22	66.7	61	50.0	2	7.7
	Other (please describe):	32	17.7	8	24.2	15	12.3	9	34.6
	None	2	1.1	0	.0	1	.8	1	3.8
	Total N	181	100.0	33	100.0	122	100.0	26	100.0
2020-21	4Rs	2	1.1	1	3.0	0	.0	1	3.8
	MindUp	5	2.7	0	.0	5	4.0	0	.0
	PATHS	1	.5	0	.0	1	.8	0	.0
	PBIS	93	50.8	24	72.7	58	46.8	11	42.3
	Responsive Classroom	84	45.9	15	45.5	65	52.4	4	15.4
	<b>Restorative Practices</b>	83	45.4	18	54.5	54	43.5	11	42.3
	RULER	57	31.1	15	45.5	41	33.1	1	3.8
	Second Step	88	48.1	24	72.7	62	50.0	2	7.7
	Other (please describe):	43	23.5	8	24.2	25	20.2	10	38.5
	None	2	1.1	0	.0	1	.8	1	3.8
	Total N	183	100.0	33	100.0	124	100.0	26	100.0

#### Table D50. District-reported SEL programs/approaches used by middle schools during 2019-20 and 2020-21 District Inventory: Q47m\_1. What social and emotional learning (SEL) program/approach were your middle schools using, if any,

						Distri	ct Type			
		Ov	erall	Alliance	e districts	Non-Allia	nce districts	AP	APSEPs	
	_	Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid	
		Count	Percent	Count	Percent	Count	Percent	Count	Percent	
2019-20	4Rs	1	.6	0	.0	0	.0	1	3.3	
	MindUp	3	1.8	0	.0	2	1.9	1	3.3	
	PATHS	2	1.2	0	.0	1	1.0	1	3.3	
	PBIS	78	47.9	17	58.6	45	43.3	16	53.3	
	Responsive Classroom	37	22.7	5	17.2	26	25.0	6	20.0	
	<b>Restorative Practices</b>	88	54.0	22	75.9	52	50.0	14	46.7	
	RULER	37	22.7	11	37.9	26	25.0	0	.0	
	Second Step	39	23.9	8	27.6	29	27.9	2	6.7	
	Other (please describe):	33	20.2	6	20.7	16	15.4	11	36.7	
	None	5	3.1	0	.0	5	4.8	0	.0	
	Total N	163	100.0	29	100.0	104	100.0	30	100.0	
2020-21	4Rs	1	.6	0	.0	0	.0	1	3.2	
	MindUp	3	1.8	0	.0	2	1.9	1	3.2	
	PATHS	2	1.2	0	.0	1	.9	1	3.2	
	PBIS	73	43.2	17	54.8	42	39.3	14	45.2	
	Responsive Classroom	39	23.1	6	19.4	27	25.2	6	19.4	
	<b>Restorative Practices</b>	100	59.2	24	77.4	61	57.0	15	48.4	
	RULER	44	26.0	12	38.7	31	29.0	1	3.2	
	Second Step	42	24.9	10	32.3	30	28.0	2	6.5	
	Other (please describe):	39	23.1	6	19.4	20	18.7	13	41.9	
	None	5	3.0	0	.0	5	4.7	0	.0	
	Total N	169	100.0	31	100.0	107	100.0	31	100.0	

during the following school years?

						Distric	t Type		
		Ov	erall	Alliance	e districts	Non-Allia	nce districts	AP	SEPs
	_	Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid
		Count	Percent	Count	Percent	Count	Percent	Count	Percent
2019-20	4Rs	0	.0	0	.0	0	.0	0	.0
	MindUp	2	1.4	0	.0	0	.0	2	5.7
	PATHS	3	2.1	0	.0	1	1.2	2	5.7
	PBIS	62	43.1	13	48.1	30	36.6	19	54.3
	Responsive Classroom	17	11.8	2	7.4	7	8.5	8	22.9
	<b>Restorative Practices</b>	79	54.9	20	74.1	44	53.7	15	42.9
	RULER	27	18.8	7	25.9	20	24.4	0	.0
	Second Step	15	10.4	6	22.2	7	8.5	2	5.7
	Other (please describe):	28	19.4	3	11.1	14	17.1	11	31.4
	None	6	4.2	0	.0	6	7.3	0	.0
	Total N	144	100.0	27	100.0	82	100.0	35	100.0
2020-21	4Rs	0	.0	0	.0	0	.0	0	.0
	MindUp	2	1.3	0	.0	0	.0	2	5.4
	PATHS	3	2.0	0	.0	1	1.1	2	5.4
	PBIS	60	39.2	13	44.8	28	32.2	19	51.4
	Responsive Classroom	19	12.4	3	10.3	8	9.2	8	21.6
	<b>Restorative Practices</b>	89	58.2	21	72.4	53	60.9	15	40.5
	RULER	33	21.6	8	27.6	25	28.7	0	.0
	Second Step	16	10.5	6	20.7	7	8.0	3	8.1
	Other (please describe):	33	21.6	3	10.3	17	19.5	13	35.1
	None	6	3.9	0	.0	6	6.9	0	.0
	Total N	153	100.0	29	100.0	87	100.0	37	100.0

#### Table D51. District-reported SEL programs/approaches used by high schools during 2019-20 and 2020-21

District Inventory: Q47h 1. What social and emotional learning (SEL) program/approach were your high schools using, if any, during the following school years?

#### Table D52. Teacher-reported school support by grade level for students' physical health in 2020-21

Teacher Survey Q24\_1. In your opinion, how adequately did your school support students' physical health during the 2020-21 school year?

			District Type						
		Ov	erall	Alliance	nce districts				
		Valid	Valid	Valid	Valid	Valid	Valid		
		Count	Percent	Count	Percent	Count	Percent		
Elementary school	Support was extremely inadequate	88	10.2	50	13.7	38	7.6		
	Support was somewhat inadequate	140	16.2	67	18.4	73	14.7		
	Support was neither adequate nor inadequate	216	25.1	99	27.2	117	23.5		
	Support was somewhat adequate	277	32.1	108	29.7	169	33.9		
	Support was extremely adequate	141	16.4	40	11.0	101	20.3		
	Total N	862	100.0	364	100.0	498	100.0		
Middle school	Support was extremely inadequate	34	6.6	13	8.0	21	6.0		
	Support was somewhat inadequate	107	20.8	40	24.5	67	19.0		
	Support was neither adequate nor inadequate	137	26.6	42	25.8	95	27.0		
	Support was somewhat adequate	147	28.5	44	27.0	103	29.3		
	Support was extremely adequate	90	17.5	24	14.7	66	18.8		
	Total N	515	100.0	163	100.0	352	100.0		
High school	Support was extremely inadequate	84	10.6	37	15.2	47	8.5		
	Support was somewhat inadequate	169	21.2	64	26.2	105	19.0		
	Support was neither adequate nor inadequate	212	26.6	64	26.2	148	26.8		
	Support was somewhat adequate	231	29.0	53	21.7	178	32.2		
	Support was extremely adequate	100	12.6	26	10.7	74	13.4		
	Total N	796	100.0	244	100.0	552	100.0		
Multiple levels,	Support was extremely inadequate	23	7.8	13	13.1	10	5.2		
ungraded, or	Support was somewhat inadequate	51	17.4	18	18.2	33	17.0		
unknown	Support was neither adequate nor inadequate	85	29.0	30	30.3	55	28.4		
	Support was somewhat adequate	79	27.0	28	28.3	51	26.3		
	Support was extremely adequate	55	18.8	10	10.1	45	23.2		
	Total N	293	100.0	99	100.0	194	100.0		

#### Table D53. Teacher-reported school support by grade level for students' social-emotional well-being in 2020-21

Teacher Survey Q24\_3. In your opinion, how adequately did your school support students social and emotional well-being during the 2020-21 school year?

			District Type					
		Ov	erall	Allianc	e districts	Non-Allia	nce districts	
		Valid	Valid	Valid	Valid	Valid	Valid	
		Count	Percent	Count	Percent	Count	Percent	
Elementary school	Support was extremely inadequate	111	12.9	67	18.4	44	8.9	
	Support was somewhat inadequate	222	25.8	92	25.3	130	26.2	
	Support was neither adequate nor inadequate	140	16.3	63	17.3	77	15.5	
	Support was somewhat adequate	286	33.2	105	28.8	181	36.4	
	Support was extremely adequate	102	11.8	37	10.2	65	13.1	
	Total N	861	100.0	364	100.0	497	100.0	
Middle school	Support was extremely inadequate	80	15.5	34	20.9	46	13.1	
	Support was somewhat inadequate	133	25.8	44	27.0	89	25.3	
	Support was neither adequate nor inadequate	90	17.5	23	14.1	67	19.0	
	Support was somewhat adequate	158	30.7	45	27.6	113	32.1	
	Support was extremely adequate	54	10.5	17	10.4	37	10.5	
	Total N	515	100.0	163	100.0	352	100.0	
High school	Support was extremely inadequate	99	12.4	47	19.3	52	9.4	
	Support was somewhat inadequate	211	26.5	70	28.7	141	25.5	
	Support was neither adequate nor inadequate	155	19.5	44	18.0	111	20.1	
	Support was somewhat adequate	255	32.0	63	25.8	192	34.8	
	Support was extremely adequate	76	9.5	20	8.2	56	10.1	
	Total N	796	100.0	244	100.0	552	100.0	
Multiple levels,	Support was extremely inadequate	40	13.6	15	15.0	25	12.9	
ungraded, or	Support was somewhat inadequate	66	22.4	24	24.0	42	21.6	
unknown	Support was neither adequate nor inadequate	45	15.3	14	14.0	31	16.0	
	Support was somewhat adequate	111	37.8	35	35.0	76	39.2	
	Support was extremely adequate	32	10.9	12	12.0	20	10.3	
	Total N	294	100.0	100	100.0	194	100.0	

#### Table D54. Teacher-reported support for students' physical and emotional well-being

*Teacher survey Q36. Is there anything else you'd like to share about your experiences as a Connecticut teacher during the COVID-19 pandemic?* 

#### Impacts on Students: Basic Needs

Responses to the open-text question at the end of the teacher survey revealed that students had difficulty accessing basic needs like housing and food. One teacher highlighted that families were uncomfortable accessing support for meeting their basic needs, even when supports were available to students. Other teachers reported that their schools did a great job in ensuring all students' basic needs were met.

#### Student Impacts: Socio-Emotional Well-Being and Mental Health

In their responses to the open-text teacher survey question, some teachers reported inadequate support for students' emotional wellbeing. One teacher said, "schools have started SEL initiatives to be able to say that they are doing something but eventually have stopped any programs they do because it has been checked off the list." Another teacher described the inadequate support by commenting, "my school has 2 guidance counselors, 1 school psychologist and 0 social workers…for 3 grades of middle school. It is not enough!"
#### Appendix E: Supports for teachers (Research Goal 3)

Research Question 3a. What do administrators and teachers say about how the pandemic and the resources provided affected teaching and teacher well-being?

#### Table E1. District-reported staffing adjustments/reassignments in spring 2020

District Inventory Q9. Please describe any adjustments/reassignments you made to staffing to accommodate the pivot to remote learning in March of 2020 due to the emergency response to COVID-19.

When asked to describe staffing adjustments in the spring of 2020, the topic referenced most frequently (by 49 districts) was shifts in job responsibilities or reassignments to new job roles as a result of the sudden shift to remote learning. Because all learning was remote in spring 2020, teachers generally remained in their roles whereas auxiliary staff were reassigned. For example, interventionists and paraeducators prepared class materials, provided online classroom support, and maintained 1-on-1 contact with individual students. Media specialists, IT staff, and technology coaches were often shifted to support teachers and students in working with remote-learning technology. Nine districts mentioned an increase in professional development and technology training for these auxiliary staff to allow them to support instruction, and six districts reported providing devices (such as Chromebooks) to certain staff to support remote learning. Other responsibilities of these staff included the delivery of classroom materials, technology, and meals to student homes. Outside of the districts that reported these reassignments, 17 districts explicitly mentioned that no staffing adjustments were necessary or occurred in the spring of 2020. Five districts described hiring of new staff, primarily substitute teachers or technology supports. Several districts noted that the majority of staffing changes resulting from the pandemic did not occur in the immediate emergency response, but rather in the following school year as districts adjusted to new learning models. There were also some adjustments to the schedule noted, primarily a shortened school day or a shortened amount of instructional time. When instructional time was shortened, the remainder of the time was dedicated to small group interaction or asynchronous work.

#### Table E2. District-reported staffing adjustments/reassignments in fall 2020

District Inventory Q17. Please describe any adjustments/reassignments you made to staffing to accommodate remote learning in fall 2020.

As opposed to the spring of 2020, the primary fall 2020 staffing adjustment theme reported by districts was the hiring of new staff, which was discussed by 54 districts. Additional teachers were hired primarily to take on the responsibility of teaching fully remote students, although some districts reported hiring additional substitute and floater teachers to support quarantined teachers. Additional support staff were also hired to support remote learners, such as paraeducators, tutors, and technology specialists. Some districts hired extra security guards and custodians to promote COVID-19 safety. Staff reassignments were also common during this period, as was

referenced by 32 districts. Many teachers were reassigned from in-person teaching positions to remote teaching positions, and some teachers were assigned to cover additional sections. Many auxiliary staff members, like library media specialists, technology specialists, interventionists, and arts/PE teachers were reassigned to both virtual and in-person teaching positions. These employees were sometimes assigned to individual students to provide academic and social-emotional support. Some districts that attempted to fill new positions to support virtual learning reported that hiring was unsuccessful. Eight districts reported schedule adjustments, primarily to support hybrid/remote models of learning. Multiple districts reported that the school day or instructional time was shortened to provide time for small-group interaction or time for teachers to connect with remote students.

### Table E3. District-reported summer 2020 preparation for fall 2020: safety-related activities

District Inventory Q15\_1, Q15\_2, Q15\_5, Q15\_6. Which of the following activities did your district conduct between the last student day of spring 2020 and students' return to school in fall 2020? Please select all that apply.

	District Type									
	Ove	erall	Alliance	e districts	Non-Allia	nce districts	APSEPs			
	Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid		
	Count	Percent	Count	Percent	Count	Percent	Count	Percent		
Building improvements (ventilation, air purification	206	92.4	31	96.9	132	93.6	43	86.0		
devices, directional signs)										
Purchase of safety equipment (PPE, e.g., shields, masks)	222	99.6	32	100.0	141	100.0	49	98.0		
Hiring additional personnel (e.g., tutors, counselors, etc.)	127	57.0	26	81.3	92	65.2	9	18.0		
COVID safety training for school personnel	213	95.5	32	100.0	133	94.3	48	96.0		
Other (please describe):	45	20.2	11	34.4	29	20.6	5	10.0		
None of the above	21	9.4	4	12.5	11	7.8	6	12.0		
Total N	223	100.0	32	100.0	141	100.0	50	100.0		

Of the 45 districts that indicated that they used other strategies to prepare for the 2020-21 school year, several reported safety-related activities that supported teacher well-being. For example, a number of districts reported that they engaged stakeholders (mainly staff and parents) in planning for the fall semester. This included forming committees of any interested parties, conducting listening sessions with families and staff, and holding virtual parent presentations to ensure that parent, student, and staff feedback was considered. It was important to many districts that they create a district-wide return plan for maximizing safety while returning to inperson learning.

#### Table E4. Teacher-reported teaching challenges in 2020-21 (elementary school teachers)

Teacher Survey Q18. Rate each of the following areas in terms of how difficult it was to achieve during the 2020-2021 school year, compared to before the pandemic.

	District Type								
		Overall		A	lliance distri	cts	Non	-Alliance dis	stricts
	Ν	Mean	(SD)	N	Mean	(SD)	Ν	Mean	(SD)
Facilitating student engagement	956	5.6	(1.3)	396	5.5	(1.5)	560	5.6	(1.2)
Eliciting student participation during instruction	956	5.5	(1.3)	399	5.5	(1.4)	557	5.4	(1.2)
Motivating students to complete assignments	951	5.6	(1.3)	397	5.6	(1.4)	554	5.6	(1.2)
Ensuring student access to instructional materials (for example, textbooks, videos, other media, etc.)	956	5.4	(1.3)	399	5.3	(1.4)	557	5.4	(1.3)
Learning about each student's individual interests, strengths, and needs	957	5.0	(1.4)	398	5.0	(1.5)	559	5.1	(1.4)
Setting learning goals	958	5.1	(1.2)	396	5.0	(1.3)	562	5.1	(1.2)
Viewing, collecting, or analyzing student work (e.g., student math solutions, student writing pieces)	952	5.4	(1.4)	396	5.4	(1.5)	556	5.4	(1.3)
Conducting formative assessments (for example, to guide daily teaching, student personalization, etc.)	952	5.5	(1.4)	396	5.4	(1.5)	556	5.5	(1.3)
Preparing students for summative assessments (high stakes tests and unit tests)	949	5.6	(1.3)	396	5.6	(1.4)	553	5.6	(1.2)
Adjusting instruction to accommodate individualized education plans (IEPs)	957	5.5	(1.3)	399	5.5	(1.4)	558	5.5	(1.3)
Accessing resources, supports, and specialized assistance and services to meet students learning differences or needs (for example, students with disabilities or English learners)	953	5.5	(1.3)	396	5.5	(1.4)	557	5.5	(1.3)
Establishing and using small group instruction (for example, breakout groups, reading groups, stations, jigsaw, etc.)	955	5.7	(1.5)	397	5.5	(1.6)	558	5.8	(1.3)
Delivering course content (for example, direct instruction, presentations)	956	5.4	(1.3)	397	5.3	(1.4)	559	5.5	(1.3)
Establishing and maintaining classroom norms and behavior expectations	952	5.2	(1.4)	397	5.1	(1.5)	555	5.4	(1.3)
Lesson planning (including selecting/securing resources, preparing materials, coordinating with colleagues, etc.)	952	5.4	(1.5)	397	5.1	(1.6)	555	5.6	(1.4)
Adjusting instruction in real-time to respond to student needs and reactions	952	5.5	(1.3)	396	5.4	(1.4)	556	5.5	(1.3)
Coping with unexpected challenges or interruptions during teaching (for example, technology issues, student illness, etc.)	956	5.9	(1.2)	397	5.8	(1.3)	559	6.0	(1.2)
Promoting social and emotional learning	955	5.5	(1.4)	396	5.5	(1.5)	559	5.5	(1.4)
Collaborating with families to promote learner growth and development	958	4.9	(1.5)	395	4.9	(1.5)	563	4.9	(1.4)
Collaborating with colleagues to promote learner growth and development	959	5.0	(1.4)	399	4.8	(1.5)	560	5.1	(1.4)

#### Table E5. Teacher-reported teaching challenges in 2020-21 (middle school teachers)

Teacher Survey Q18. Rate each of the following areas in terms of how difficult it was to achieve during the 2020-2021 school year, compared to before the pandemic.

	District Type								
		Overa	11	А	lliance distric	ets	Non	-Alliance dis	stricts
	Ν	Mean	(SD)	Ν	Mean	(SD)	Ν	Mean	(SD)
Facilitating student engagement	554	5.8	(1.3)	177	5.6	(1.5)	377	5.9	(1.2)
Eliciting student participation during instruction	558	5.8	(1.3)	178	5.6	(1.6)	380	5.9	(1.2)
Motivating students to complete assignments	558	5.9	(1.3)	178	5.6	(1.5)	380	6.0	(1.2)
Ensuring student access to instructional materials (for example, textbooks, videos, other media, etc.)	558	4.8	(1.5)	178	4.7	(1.7)	380	4.9	(1.4)
Learning about each student's individual interests, strengths, and needs	557	5.4	(1.3)	177	5.1	(1.6)	380	5.5	(1.2)
Setting learning goals	556	5.0	(1.2)	177	4.7	(1.4)	379	5.1	(1.1)
Viewing, collecting, or analyzing student work (e.g., student math solutions, student writing pieces)	555	4.9	(1.5)	177	4.7	(1.7)	378	5.0	(1.4)
Conducting formative assessments (for example, to guide daily teaching, student personalization, etc.)	556	5.1	(1.4)	176	4.9	(1.7)	380	5.2	(1.2)
Preparing students for summative assessments (high stakes tests and unit tests)	554	5.6	(1.2)	175	5.4	(1.4)	379	5.6	(1.1)
Adjusting instruction to accommodate individualized education plans (IEPs)	554	5.3	(1.4)	176	5.2	(1.7)	378	5.4	(1.2)
Accessing resources, supports, and specialized assistance and services to meet students learning differences or needs (for example, students with disabilities or English learners)	554	5.3	(1.4)	176	5.2	(1.6)	378	5.3	(1.2)
Establishing and using small group instruction (for example, breakout groups, reading groups, stations, jigsaw, etc.)	555	5.7	(1.5)	177	5.4	(1.8)	378	5.8	(1.3)
Delivering course content (for example, direct instruction, presentations)	555	5.3	(1.4)	177	5.1	(1.5)	378	5.4	(1.3)
Establishing and maintaining classroom norms and behavior expectations	557	5.1	(1.6)	176	4.7	(1.8)	381	5.3	(1.4)
Lesson planning (including selecting/securing resources, preparing materials, coordinating with colleagues, etc.)	558	5.2	(1.5)	176	4.8	(1.7)	382	5.3	(1.3)
Adjusting instruction in real-time to respond to student needs and reactions	558	5.3	(1.4)	178	4.9	(1.6)	380	5.5	(1.2)
Coping with unexpected challenges or interruptions during teaching (for example, technology issues, student illness, etc.)	559	5.7	(1.3)	178	5.5	(1.5)	381	5.9	(1.2)
Promoting social and emotional learning	556	5.4	(1.5)	177	5.0	(1.8)	379	5.6	(1.4)
Collaborating with families to promote learner growth and development	557	5.1	(1.4)	176	4.9	(1.6)	381	5.2	(1.2)
Collaborating with colleagues to promote learner growth and development	557	4.8	(1.4)	177	4.6	(1.6)	380	4.9	(1.3)

#### Table E6. Teacher-reported teaching challenges in 2020-21 (high school teachers)

Teacher Survey Q18. Rate each of the following areas in terms of how difficult it was to achieve during the 2020-2021 school year, compared to before the pandemic.

	District Type								
		Overa	11	А	lliance distric	ets	Non	-Alliance dis	stricts
	Ν	Mean	(SD)	Ν	Mean	(SD)	Ν	Mean	(SD)
Facilitating student engagement	840	6.1	(1.2)	257	6.0	(1.3)	583	6.1	(1.2)
Eliciting student participation during instruction	840	6.1	(1.3)	255	6.0	(1.4)	585	6.1	(1.2)
Motivating students to complete assignments	839	6.0	(1.2)	256	6.0	(1.3)	583	6.0	(1.1)
Ensuring student access to instructional materials (for example, textbooks, videos, other media, etc.)	840	4.9	(1.4)	258	4.8	(1.5)	582	5.0	(1.4)
Learning about each student's individual interests, strengths, and needs	844	5.6	(1.4)	258	5.5	(1.4)	586	5.7	(1.3)
Setting learning goals	842	5.1	(1.2)	259	5.0	(1.3)	583	5.1	(1.2)
Viewing, collecting, or analyzing student work (e.g., student math solutions, student writing pieces)	840	4.9	(1.5)	257	4.8	(1.6)	583	5.0	(1.5)
Conducting formative assessments (for example, to guide daily teaching, student personalization, etc.)	841	5.4	(1.3)	258	5.2	(1.4)	583	5.4	(1.3)
Preparing students for summative assessments (high stakes tests and unit tests)	840	5.7	(1.2)	258	5.6	(1.2)	582	5.7	(1.1)
Adjusting instruction to accommodate individualized education plans (IEPs)	836	5.4	(1.3)	256	5.3	(1.4)	580	5.4	(1.3)
Accessing resources, supports, and specialized assistance and services to meet students learning differences or needs (for example, students with disabilities or English learners)	839	5.3	(1.3)	256	5.3	(1.4)	583	5.3	(1.3)
Establishing and using small group instruction (for example, breakout groups, reading groups, stations, jigsaw, etc.)	840	5.7	(1.4)	258	5.5	(1.6)	582	5.8	(1.3)
Delivering course content (for example, direct instruction, presentations)	842	5.3	(1.4)	257	5.1	(1.5)	585	5.4	(1.3)
Establishing and maintaining classroom norms and behavior expectations	840	5.3	(1.5)	257	5.1	(1.6)	583	5.5	(1.5)
Lesson planning (including selecting/securing resources, preparing materials, coordinating with colleagues, etc.)	838	5.3	(1.4)	257	5.1	(1.5)	581	5.4	(1.3)
Adjusting instruction in real-time to respond to student needs and reactions	837	5.5	(1.4)	256	5.3	(1.4)	581	5.6	(1.3)
Coping with unexpected challenges or interruptions during teaching (for example, technology issues, student illness, etc.)	842	5.7	(1.3)	260	5.5	(1.5)	582	5.8	(1.2)
Promoting social and emotional learning	839	5.6	(1.4)	258	5.4	(1.5)	581	5.7	(1.3)
Collaborating with families to promote learner growth and development	841	5.2	(1.3)	257	5.1	(1.4)	584	5.2	(1.3)
Collaborating with colleagues to promote learner growth and development	840	5.1	(1.4)	256	5.1	(1.5)	584	5.1	(1.4)

#### Table E7. Teacher-reported teaching challenges in 2020-21 (mixed level teachers)

Teacher Survey Q18. Rate each of the following areas in terms of how difficult it was to achieve during the 2020-2021 school year, compared to before the pandemic.

	District Type								
		Overa	11	A	lliance distric	sts	Non	-Alliance dis	tricts
	Ν	Mean	(SD)	Ν	Mean	(SD)	Ν	Mean	(SD)
Facilitating student engagement	322	5.7	(1.3)	103	5.9	(1.2)	219	5.7	(1.4)
Eliciting student participation during instruction	322	5.6	(1.3)	102	5.8	(1.3)	220	5.6	(1.3)
Motivating students to complete assignments	321	5.8	(1.3)	101	5.9	(1.2)	220	5.7	(1.3)
Ensuring student access to instructional materials (for example, textbooks, videos, other media, etc.)	322	5.1	(1.5)	101	5.3	(1.4)	221	5.0	(1.5)
Learning about each student's individual interests, strengths, and needs	321	5.1	(1.5)	102	5.2	(1.5)	219	5.1	(1.4)
Setting learning goals	321	5.1	(1.2)	103	5.2	(1.2)	218	5.0	(1.2)
Viewing, collecting, or analyzing student work (e.g., student math solutions, student writing pieces)	322	5.1	(1.4)	103	5.1	(1.5)	219	5.1	(1.3)
Conducting formative assessments (for example, to guide daily teaching, student personalization, etc.)	319	5.2	(1.4)	102	5.3	(1.4)	217	5.2	(1.4)
Preparing students for summative assessments (high stakes tests and unit tests)	318	5.6	(1.3)	102	5.6	(1.3)	216	5.6	(1.2)
Adjusting instruction to accommodate individualized education plans (IEPs)	322	5.3	(1.3)	102	5.4	(1.3)	220	5.3	(1.3)
Accessing resources, supports, and specialized assistance and services to meet students learning differences or needs (for example, students with disabilities or English learners)	323	5.3	(1.4)	103	5.4	(1.4)	220	5.3	(1.3)
Establishing and using small group instruction (for example, breakout groups, reading groups, stations, jigsaw, etc.)	323	5.5	(1.5)	104	5.6	(1.5)	219	5.5	(1.5)
Delivering course content (for example, direct instruction, presentations)	323	5.3	(1.4)	103	5.5	(1.3)	220	5.2	(1.5)
Establishing and maintaining classroom norms and behavior expectations	320	5.4	(1.5)	102	5.4	(1.5)	218	5.3	(1.4)
Lesson planning (including selecting/securing resources, preparing materials, coordinating with colleagues, etc.)	321	5.3	(1.4)	102	5.3	(1.5)	219	5.3	(1.4)
Adjusting instruction in real-time to respond to student needs and reactions	321	5.5	(1.4)	103	5.5	(1.3)	218	5.4	(1.4)
Coping with unexpected challenges or interruptions during teaching (for example, technology issues, student illness, etc.)	321	5.7	(1.4)	103	5.7	(1.4)	218	5.7	(1.4)
Promoting social and emotional learning	321	5.5	(1.4)	102	5.5	(1.4)	219	5.6	(1.4)
Collaborating with families to promote learner growth and development	323	5.0	(1.4)	104	5.1	(1.5)	219	5.0	(1.4)
Collaborating with colleagues to promote learner growth and development	320	5.0	(1.4)	101	5.1	(1.5)	219	4.9	(1.4)

### Table E8. Teacher-reported support for staff's physical health and emotional well-being in 2020-21 (elementary school teachers)

Teacher Survey Q24\_4 & Q24\_5. In your opinion, how adequately did your school support school staff's physical health and social and emotional well-being during the 2020-21 school year?

		District Type									
		Ov	erall	Alliance	e districts	Non-Allia	nce districts				
	_	Valid Valid		Valid	Valid	Valid	Valid				
		Count	Percent	Count	Percent	Count	Percent				
School staff	Support was extremely inadequate	205	23.8	105	28.8	100	20.1				
physical health	Support was somewhat inadequate	233	27.1	99	27.2	134	27.0				
	Support was neither adequate nor inadequate	172	20.0	75	20.6	97	19.5				
	Support was somewhat adequate	188	21.8	65	17.9	123	24.7				
	Support was extremely adequate	63	7.3	20	5.5	43	8.7				
	Total N	861	100.0	364	100.0	497	100.0				
School staff social	Support was extremely inadequate	324	37.6	148	40.8	176	35.3				
and emotional	Support was somewhat inadequate	237	27.5	99	27.3	138	27.7				
well-being	Support was neither adequate nor inadequate	99	11.5	44	12.1	55	11.0				
-	Support was somewhat adequate	156	18.1	55	15.2	101	20.3				
	Support was extremely adequate	45	5.2	17	4.7	28	5.6				
	Total N	861	100.0	363	100.0	498	100.0				

**Table E9. Teacher-reported support for staff's physical health and emotional well-being in 2020-21 (middle school teachers)** *Teacher Survey Q24 4 & Q24 5. In your opinion, how adequately did your school support school staff's physical health and social and emotional well-being during the 2020-21 school year?* 

		District Type									
		(	Overall	Allianc	e districts	Non-Allia	nce districts				
		Valid	Valid	Valid	Valid	Valid	Valid				
		Count	Percent	Count	Percent	Count	Percent				
School staff	Support was extremely inadequate	115	22.3	43	26.4	72	20.4				
physical health	Support was somewhat inadequate	160	31.0	48	29.4	112	31.7				
	Support was neither adequate nor inadequate	102	19.8	28	17.2	74	21.0				
	Support was somewhat adequate	97	18.8	30	18.4	67	19.0				
	Support was extremely adequate	42	8.1	14	8.6	28	7.9				
	Total N	516	100.0	163	100.0	353	100.0				
School staff social	Support was extremely inadequate	199	38.6	60	36.8	139	39.4				
and emotional	Support was somewhat inadequate	149	28.9	47	28.8	102	28.9				
well-being	Support was neither adequate nor inadequate	75	14.5	26	16.0	49	13.9				
	Support was somewhat adequate	68	13.2	22	13.5	46	13.0				
	Support was extremely adequate	25	4.8	8	4.9	17	4.8				
	Total N	516	100.0	163	100.0	353	100.0				

**Table E10. Teacher-reported support for staff's physical health and emotional well-being in 2020-21 (high school teachers)** *Teacher Survey Q24 4 & Q24 5. In your opinion, how adequately did your school support school staff's physical health and social and emotional well-being during the 2020-21 school year?* 

		District Type									
		(	Overall	Alliance	e districts	Non-Allia	nce districts				
		Valid	Valid	Valid	Valid	Valid	Valid				
		Count	Percent	Count	Percent	Count	Percent				
School staff	Support was extremely inadequate	216	27.1	79	32.4	137	24.8				
physical health	Support was somewhat inadequate	230	28.9	63	25.8	167	30.3				
	Support was neither adequate nor inadequate	146	18.3	47	19.3	99	17.9				
	Support was somewhat adequate	146	18.3	37	15.2	109	19.7				
	Support was extremely adequate	58	7.3	18	7.4	40	7.2				
	Total N	796	100.0	244	100.0	552	100.0				
School staff social	Support was extremely inadequate	323	40.6	110	45.1	213	38.6				
and emotional	Support was somewhat inadequate	205	25.8	54	22.1	151	27.4				
well-being	Support was neither adequate nor inadequate	103	12.9	35	14.3	68	12.3				
5	Support was somewhat adequate	125	15.7	32	13.1	93	16.8				
	Support was extremely adequate	40	5.0	13	5.3	27	4.9				
	Total N	796	100.0	244	100.0	552	100.0				

**Table E11. Teacher-reported support for staff's physical health and emotional well-being in 2020-21 (mixed level teachers)** *Teacher Survey Q24 4 & Q24 5. In your opinion, how adequately did your school support school staff's physical health and social and emotional well-being during the 2020-21 school year?* 

		District Type									
		(	Overall	Allianc	e districts	Non-Allia	nce districts				
		Valid	Valid	Valid	Valid	Valid	Valid				
		Count	Percent	Count	Percent	Count	Percent				
School staff	Support was extremely inadequate	74	25.3	30	30.0	44	22.9				
physical health Su Su Su	Support was somewhat inadequate	81	27.7	27	27.0	54	28.1				
	Support was neither adequate nor inadequate	63	21.6	19	19.0	44	22.9				
	Support was somewhat adequate	50	17.1	17	17.0	33	17.2				
	Support was extremely adequate	24	8.2	7	7.0	17	8.9				
	Total N	292	100.0	100	100.0	192	100.0				
School staff social	Support was extremely inadequate	99	33.7	35	35.0	64	33.0				
and emotional	Support was somewhat inadequate	77	26.2	20	20.0	57	29.4				
well-being	Support was neither adequate nor inadequate	46	15.6	15	15.0	31	16.0				
	Support was somewhat adequate	54	18.4	24	24.0	30	15.5				
	Support was extremely adequate	18	6.1	6	6.0	12	6.2				
	Total N	294	100.0	100	100.0	194	100.0				

#### Table E12. Teacher-reported resources/supports needed during the pandemic (elementary teachers)

Teacher Survey Q28\_1r to Q28\_10r. How much of a need did you have for the following resources/supports during the pandemic, compared to before the pandemic?

	District Type								
	Overall			A	Alliance districts			-Alliance dis	tricts
	Ν	Mean	(SD)	Ν	Mean	(SD)	Ν	Mean	(SD)
Remote and/or hybrid lesson plans	594	4.6	(.8)	241	4.5	(.9)	353	4.7	(.7)
Social and emotional learning lesson plans or strategies	596	4.3	(.9)	241	4.2	(1.0)	355	4.3	(.8)
Strategies for addressing the trauma that students have experienced	595	4.4	(.9)	241	4.4	(.9)	354	4.4	(.9)
Strategies to keep students engaged and motivated	599	4.4	(.8)	243	4.4	(.9)	356	4.4	(.8)
Strategies to catch students up to grade level	591	4.4	(.9)	237	4.4	(.9)	354	4.3	(.9)
Strategies to assess students' academic learning	596	4.0	(1.0)	242	4.0	(1.0)	354	4.0	(.9)
Additional school staff who can address students' social and emotional needs	587	4.5	(.8)	241	4.5	(.8)	346	4.5	(.8)
Additional school or district staff who can address students' difficulties in using technology	592	4.4	(.8)	240	4.5	(.8)	352	4.4	(.9)
Additional staff or technology to help me teach students concurrently	577	4.4	(.8)	236	4.5	(.8)	341	4.4	(.9)
Other	111	4.2	(1.0)	41	4.1	(1.1)	70	4.3	(1.0)

Please note, these items range from 1-5, with 1 = Much less of a need to 5 = Much more of a need.

#### Table E13. Teacher-reported resources/supports needed during the pandemic (middle school teachers)

Teacher Survey Q28 1r to Q28 10r. How much of a need did you have for the following resources/supports during the pandemic, compared to before the pandemic?

	District Type									
		Overal	1	А	lliance distri	ets	Non	-Alliance dis	tricts	
	Ν	Mean	(SD)	Ν	Mean	(SD)	Ν	Mean	(SD)	
Remote and/or hybrid lesson plans	353	4.6	(.8)	108	4.4	(.9)	245	4.6	(.7)	
Social and emotional learning lesson plans or strategies	349	4.3	(.9)	108	4.2	(.9)	241	4.3	(.8)	
Strategies for addressing the trauma that students have experienced	345	4.4	(.8)	105	4.3	(.9)	240	4.4	(.8)	
Strategies to keep students engaged and motivated	354	4.5	(.8)	108	4.5	(.7)	246	4.5	(.8)	
Strategies to catch students up to grade level	348	4.4	(.8)	106	4.4	(.8)	242	4.3	(.9)	
Strategies to assess students' academic learning	351	3.9	(.9)	106	4.0	(.9)	245	3.9	(.9)	
Additional school staff who can address students' social and emotional needs	346	4.4	(.8)	106	4.5	(.8)	240	4.4	(.8)	
Additional school or district staff who can address students' difficulties in using technology	352	4.3	(.8)	108	4.4	(.8)	244	4.2	(.8)	
Additional staff or technology to help me teach students concurrently	337	4.3	(.9)	105	4.2	(1.0)	232	4.4	(.8)	
Other	67	4.2	(1.0)	22	4.0	(1.0)	45	4.3	(1.1)	

Please note, these items range from 1-5, with 1 = Much less of a need to 5 = Much more of a need.

#### Table E14. Teacher-reported resources/supports needed during the pandemic (high school teachers)

Teacher Survey Q28 1r to Q28 10r. How much of a need did you have for the following resources/supports during the pandemic, compared to before the pandemic?

	District Type									
	Overall			А	Alliance districts			Non-Alliance districts		
	Ν	Mean	(SD)	Ν	Mean	(SD)	Ν	Mean	(SD)	
Remote and/or hybrid lesson plans	534	4.5	(.8)	174	4.4	(.8)	360	4.5	(.9)	
Social and emotional learning lesson plans or strategies	518	4.1	(.9)	166	4.2	(.9)	352	4.1	(.9)	
Strategies for addressing the trauma that students have experienced	514	4.2	(.9)	169	4.2	(.9)	345	4.2	(.9)	
Strategies to keep students engaged and motivated	532	4.5	(.7)	174	4.5	(.8)	358	4.6	(.7)	
Strategies to catch students up to grade level	526	4.3	(.9)	173	4.3	(.9)	353	4.3	(.9)	
Strategies to assess students' academic learning	524	4.0	(.9)	172	3.9	(.9)	352	4.0	(.9)	
Additional school staff who can address students' social and emotional needs	514	4.3	(.9)	168	4.3	(.9)	346	4.3	(.9)	
Additional school or district staff who can address students' difficulties in using technology	523	4.2	(.9)	170	4.3	(.8)	353	4.2	(.9)	
Additional staff or technology to help me teach students concurrently	518	4.2	(.9)	171	4.1	(1.0)	347	4.2	(.9)	
Other	98	4.0	(1.1)	36	4.1	(1.1)	62	3.9	(1.2)	

Please note, these items range from 1-5, with 1 = Much less of a need to 5 = Much more of a need.

#### Table E15. Teacher-reported resources/supports needed during the pandemic (mixed-level teachers)

*Teacher Survey Q28 1r to Q28 10r. How much of a need did you have for the following resources/supports during the pandemic, compared to before the pandemic?* 

						Distric	t Type			
		Overal	1	А	Alliance districts			Non-Alliance districts		
	N	Mean	(SD)	N	Mean	(SD)	Ν	Mean	(SD)	
Remote and/or hybrid lesson plans	209	4.5	(.9)	63	4.4	(.8)	146	4.5	(.9)	
Social and emotional learning lesson plans or strategies	204	4.1	(.9)	61	3.9	(1.0)	143	4.1	(.9)	
Strategies for addressing the trauma that students have experienced	202	4.3	(.9)	61	4.3	(1.0)	141	4.3	(.9)	
Strategies to keep students engaged and motivated	210	4.5	(.8)	64	4.5	(.8)	146	4.4	(.8)	
Strategies to catch students up to grade level	205	4.3	(.9)	62	4.3	(.9)	143	4.3	(.8)	
Strategies to assess students' academic learning	208	4.0	(.9)	62	4.0	(.9)	146	4.0	(.8)	
Additional school staff who can address students' social and emotional needs	200	4.4	(.9)	59	4.2	(1.1)	141	4.4	(.8)	
Additional school or district staff who can address students' difficulties in using technology	208	4.3	(.8)	63	4.4	(.8)	145	4.3	(.8)	
Additional staff or technology to help me teach students concurrently	199	4.3	(.9)	59	4.3	(.8)	140	4.2	(1.0)	
Other	38	4.0	(1.0)	12	4.0	(1.1)	26	4.0	(1.0)	

Please note, these items range from 1-5, with 1 = Much less of a need to 5 = Much more of a need.

#### Table E16. Teacher-reported effects of pandemic and resources provided on teaching and teacher well-being

*Teacher survey Q36. Is there anything else you'd like to share about your experiences as a Connecticut teacher during the COVID-19 pandemic?* 

#### Impacts on Teachers: Physical Health

In the open-ended question at the end of the teacher survey, respondents reported that the pandemic took a huge toll on their physical health. Teachers mentioned vision changes, weight gain, and increased physical illnesses, as well as chronic neck, shoulder, and back pain.

#### Impacts on Teachers: Mental Health

Responses to the open-ended teacher survey question indicated that teachers experienced an increase in negative mental health due to the pandemic. Teachers felt stressed, overwhelmed, and defeated daily not only worrying about themselves but about their students, co-workers, and family members. Others reported crying at least once a day while working. Teachers lost colleagues due to the

immense stress. Some teachers were diagnosed with anxiety, PTSD, and depression because of the pandemic. Many teachers reported that administration was not doing enough to support teacher mental health, while other described how difficult it was to support students' mental health when they themselves were suffering. A smaller proportion of teachers indicated that they had found ways to cope with the emotional impacts of the pandemic. Some respondents said they strived to maintain a positive outlook during a challenging time, while others reflected on the ways they became adaptive and resilient as strategies to stay optimistic about the future. Some respondents talked about their pride in their work, while others reported experiencing professional and personal growth.

#### Impacts on Teachers: Workload

In response to the open-ended teacher survey question, teachers reported the constant changes to the learning format and curriculum resulted in a workload that was difficult to manage. Lesson planning took 2-3 times longer during online learning formats. Grading assignments also took longer. Teachers reported working up to 16 hours a day while others said they regularly were awake past midnight working.

#### Impacts on Teachers: Work-life Balance

The responses from the open-ended teacher survey question revealed that teachers found it challenging to balance their work and their personal life. Teachers found it difficult and stressful to manage personal responsibilities like caring for children and older parents during the pandemic. Some respondents discussed the frustration they felt about the boundary between work-life and home-life becoming obsolete during the pandemic. One teacher highlighted how they had minimal home responsibilities unlike their colleagues, enabling them to spend more time learning new technology resources and plan excellent class lessons.

#### Impacts on Teachers: Burnout, Intention to Quit, Retention

Responses to the open-ended teacher survey question indicated that many teachers quit their jobs, moved their retirement date to an earlier time, or were seriously considering leaving the profession. Respondents reported feeling less safe, an increased workload without fair compensation, increasing work-related stress, and the mistreatment of teachers as reasons for burnout and the desire to quit. Of the teachers actively considering leaving their profession, losing their retirement and other benefits was the main thing discouraging them from quitting.

#### District/School Support for Teachers: District/school policies about learning (attendance, participation, grading)

In response to the open-ended teacher survey question, teachers reported that their administrations' decisions to lower expectations for students created more problems for teachers. Attendance policies during the pandemic encouraged negative behaviors from students, including increased absenteeism and disengagement. As one teacher noted "if they [students] logged in and off for only 5 minutes and didn't do any work, she [the administrator] had us mark them present." Teachers also reported many students were promoted to the next grade level when school policies indicated they should not have been.

#### Teacher Experiences: Effects of student engagement/conduct/behavior on teaching

In their responses to the open-ended teacher survey question, many teacher respondents said that they struggled with teaching remote students who were disengaged or undisciplined. One teacher said, "Students who were remote were despondent, apathetic, and unmotivated. They struggled academically and needed constant adult supervision to keep them on task." Many teachers reported that students were distracted by chaotic home environments, other activities on their computers, and social media. Furthermore, there was little accountability for remote learners, and students often refused to turn on their cameras during synchronous instruction or cheated on assignments by using online software or help from their peers. Overall, many teachers reported that students were disengaged or unmotivated, which made it hard to teach effectively. Several respondents noted that it was extremely difficult to implement special education accommodations remotely, which left these students struggling and disengaged. On the other hand, some teacher respondents reported that because hybrid learning led to fewer students in class, there were fewer behavioral issues and teachers were able to provide more personalized instruction to each student. Similarly, some remote teachers reported fewer behavioral issues and more personalized learning, which improved instruction. Remote teachers reported that they no longer had to manage physical behavioral issues or deal with classroom disruptions such as assemblies and fire drills. Respondents reported that students that were engaged and whose parents supported their academic development were successful in remote learning. One teacher said they were "motivated and encouraged by the support from parents and the self-efficacy of the students who did the work and adapted to this new way of learning." Respondents said that there were fewer pressures and expectations placed on their students in a remote environment and that they could get to know their students better. Many teachers reported that motivated students (especially those with engaged parents) thrived during remote learning, which made remote instruction more manageable and rewarding.

#### District/School Support for Teachers: School Discipline

In responses to the open-ended teacher survey question, some teachers indicated the lack of support from administration about school discipline made teaching difficult. Some teachers reported that their administrations attempted to ease the impact of the pandemic on students by relaxing school rules and lowering expectations for student conduct, which caused negative student behaviors to become unmanageable. Respondents said that students argued and ignored teacher instructions daily, which took a significant amount of time away from actual instruction.

#### District/School Support for Teachers: Social-emotional Support

Responses to the open-ended teacher survey question indicated that many teachers felt they lacked social-emotional support at work. Some respondents said that school leaders and administrators were uncaring, while others pointed to district leadership as the reason for lack of support. The lack of social-emotional support made teaching more stressful and exhausting. One of the very few teachers who reported receiving social-emotional support from their administration or district said this support helped them "professionally adapt and emotionally deal with the situation."

#### District/School Support for Teachers: Time

In response to the open-ended teacher survey question, teachers overwhelmingly reported receiving minimal time for lesson planning. One teacher commented "the contracted prep period [is not] long enough to adequately plan for that kind of instruction," going on to say "expecting educators to continue at this pace is unacceptable and a disservice to the very students we're committed to teaching because the only thing they're going to get is exhausted teachers and minimally planned/thrown together lessons." There were a few teachers who said they benefitted from an early-release/half-day each week so they had time without students to plan and prepare for instruction.

#### District/School Support for Teachers: Staffing, Duties, Job Responsibilities

A number of teachers who responded to the open-ended teacher survey question reported that the inadequate staffing during the pandemic meant that teachers were assigned an increased number of duties and job responsibilities. Teachers reported that staff shortages and not enough substitute teachers meant they were asked to cover other classes. Other teachers reported that class sizes were increased without additional staff support, which made teaching difficult. Other tasks teachers became responsible for included daily COVID-19 wellness surveys/checks, breakfast and lunch duty, recording meal orders, and cleaning of desks, chairs, and surfaces. Teachers also reported that they needed to support students as mental health professionals, despite lacking training in that field. These additional responsibilities took time away from instruction.

#### District/School Support for Teachers: Other

Through the open-ended teacher survey question, teachers reported that they did not feel supported by their schools/districts in terms of COVID-19 safety. Many teachers reported that there were very few protective measures in place, and teachers had to advocate for their own safety and buy their own protective equipment. Teachers said safety protocols that were officially in place were sometime ineffective (such as defective air filters) or were not practiced (such as cleaning protocols). Some respondents said their districts asked teachers to interact closely with student populations without adequate safety protocols, and then required teachers to use their personal sick time when to quarantine after exposure. Other teachers reported that their districts kept up to date with COVID safety measures and made proactive choices to create the safest and most effective environment for staff and students.

Many teachers described other types of support their districts and schools did and didn't provide. Some respondents reported that ineffective communication between administration and teachers made them feel unsupported. Other respondents emphasized that administrators could make an enormous difference in teachers' experiences—for the better or for the worse. Some teachers shared that their leaders showed understanding of the difficulties of remote instruction. Other teachers said their districts created opportunities for teachers to connect with their students in a meaningful way. One teacher said that her leaders "worked to create a sense of shared challenge and community to overcome difficulties".

#### Teacher Experiences: Collegiality/Collaboration

Through the open-ended teacher survey question, some teachers reported challenges to collaboration among teachers. Some teachers reported that they were not allowed to collaborate with other colleagues in person, even while wearing masks. Others said that virtual meetings were less effective for collaboration. One teacher noted "it was extremely challenging and time consuming to create effective lessons and to coordinate with colleagues." Another teacher reported that differences in workload among teachers from different subject areas created tension among teachers. At the same time, other teachers respondents said were proud of the ways they were able to collaborate with their colleagues. Colleagues shared helpful resources and taught each another how to use new teaching tools. As one teacher commented, "this was the greatest time for teacher collaboration." Several teachers expressed appreciation for their colleagues, with one teacher saying they "could not have lived through these last two years without the support of my colleagues." These teachers reported that they were thankful to have fellow teachers to lean on for support despite the hardships they faced.

# Research Question 3b. What technological resources did districts/schools provide to teachers to support remote and hybrid learning, and what technology challenges and strategies did teachers report?

#### Table E17. District-reported use of technology by elementary school teachers prior to the COVID-19 pandemic

*District Inventory:* Q4\_4 - Q4\_6. *Which of the following best describes learning opportunities for your district's elementary school students prior to the COVID-19 pandemic (before March 2020)?* 

	District Type								
	Ov	erall	Alliance	e districts	Non-Allia	nce districts	APSEPs		
	Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	
In general, teachers had access to technology	102	52.8	14	43.8	75	57.7	13	41.9	
integration support (classroom tech coaches)									
In general, teachers were using learning	97	50.3	7	21.9	78	60.0	12	38.7	
management platforms to support instruction (for									
example, Google Classroom, Schoology, etc.)									
In general, teachers were using technology	133	68.9	25	78.1	96	73.8	12	38.7	
platforms to communicate with parents (for									
example, Remind, Class Dojo)									
None of the above	29	15.0	5	15.6	15	11.5	9	29.0	
Total N	193	100.0	32	100.0	130	100.0	31	100.0	

#### Table E18. District-reported use of technology by middle school teachers prior to the COVID-19 pandemic

District Inventory: Q4\_4 - Q4\_6. Which of the following best describes learning opportunities for your district's middle school students prior to the COVID-19 pandemic (before March 2020)?

	District Type								
	Ov	erall	Alliance	e districts	Non-Allia	nce districts	AP	SEPs	
	Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	
In general, teachers had access to technology integration support (classroom tech coaches)	98	51.9	13	41.9	70	57.4	15	41.7	
In general, teachers were using learning management platforms to support instruction (for example, Google Classroom, Schoology, etc.)	127	67.2	15	48.4	94	77.0	18	50.0	
In general, teachers were using technology platforms to communicate with parents (for example, Remind, Class Dojo)	116	61.4	19	61.3	86	70.5	11	30.6	
None of the above	28	14.8	7	22.6	11	9.0	10	27.8	
Total N	189	100.0	31	100.0	122	100.0	36	100.0	

#### Table E19. District-reported use of technology by high school teachers prior to the COVID-19 pandemic

*District Inventory:* Q4\_4 - Q4\_6. *Which of the following best describes learning opportunities for your district's high school students in each of the following grade levels prior to the COVID-19 pandemic (before March 2020)?* 

	District Type								
	Ov	erall	Alliance	e districts	Non-Allia	nce districts	APS	APSEPs	
	Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	
In general, teachers had access to technology	88	50.9	13	43.3	61	60.4	14	33.3	
integration support (classroom tech coaches)									
In general, teachers were using learning	124	71.7	18	60.0	84	83.2	22	52.4	
management platforms to support instruction (for									
example, Google Classroom, Schoology, etc.)									
In general, teachers were using technology	100	57.8	18	60.0	67	66.3	15	35.7	
platforms to communicate with parents (for									
example, Remind, Class Dojo)									
None of the above	25	14.5	5	16.7	8	7.9	12	28.6	
Total N	173	100.0	30	100.0	101	100.0	42	100.0	

#### Table E20. District-reported technology provided to elementary school teachers to support remote learning

District Inventory: Q37e. What technologies were provided to elementary school teachers to support remote teaching during the two timeframes listed?

						Distri	ct Type		
		Ov	rerall	Allianc	e districts	Non-Allia	nce districts	AP	SEPs
	_	Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid
		Count	Percent	Count	Percent	Count	Percent	Count	Percent
Spring 2020	Chromebooks	136	72.0	28	84.8	89	70.6	19	63.3
	iPads	66	34.9	12	36.4	42	33.3	12	40.0
	Laptops (other than Chromebooks)	102	54.0	18	54.5	65	51.6	19	63.3
	Smartphones	6	3.2	0	.0	5	4.0	1	3.3
	Wifi hotspot devices	72	38.1	15	45.5	53	42.1	4	13.3
	Other (please describe):	15	7.9	2	6.1	13	10.3	0	.0
	Total N	189	100.0	33	100.0	126	100.0	30	100.0
2020-2021	Chromebooks	138	72.6	25	78.1	93	73.2	20	64.5
	iPads	64	33.7	13	40.6	38	29.9	13	41.9
	Laptops (other than Chromebooks)	112	58.9	22	68.8	71	55.9	19	61.3
	Smartphones	3	1.6	0	.0	2	1.6	1	3.2
	Wifi hotspot devices	72	37.9	16	50.0	50	39.4	6	19.4
	Other (please describe):	22	11.6	3	9.4	19	15.0	0	.0
	Total N	190	100.0	32	100.0	127	100.0	31	100.0

Of districts that used the open-choice option to describe other technologies provided to elementary school teachers to support remote learning, the most-reported technologies were for broadcasting remote instruction to students. These technologies include webcams, document cameras, and sound equipment like microphones and headsets to support teachers' virtual broadcasting of lessons and learning materials. A few districts also provided interactive whiteboards to further support remote instruction. Finally, multiple districts reported providing additional devices to elementary teachers if needed, including extra PCs, computer monitors, and tablets.

#### Table E21. District-reported technology provided to middle school teachers to support remote learning

District Inventory: Q37m. What technologies were provided to middle school teachers to support remote teaching during the two timeframes listed?

						Distri	ct Type		
		Ov	rerall	Allianc	e districts	Non-Allia	nce districts	AP	SEPs
		Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid
		Count	Percent	Count	Percent	Count	Percent	Count	Percent
Spring 2020	Chromebooks	124	67.4	21	67.7	84	71.8	19	52.8
	iPads	35	19.0	4	12.9	19	16.2	12	33.3
	Laptops (other than Chromebooks)	110	59.8	21	67.7	63	53.8	26	72.2
	Smartphones	9	4.9	1	3.2	4	3.4	4	11.1
	Wifi hotspot devices	60	32.6	11	35.5	47	40.2	2	5.6
	Other (please describe):	10	5.4	1	3.2	7	6.0	2	5.6
	Total N	184	100.0	31	100.0	117	100.0	36	100.0
2020-2021	Chromebooks	124	67.8	19	61.3	85	73.3	20	55.6
	iPads	38	20.8	5	16.1	21	18.1	12	33.3
	Laptops (other than Chromebooks)	115	62.8	24	77.4	66	56.9	25	69.4
	Smartphones	9	4.9	1	3.2	4	3.4	4	11.1
	Wifi hotspot devices	65	35.5	15	48.4	46	39.7	4	11.1
	Other (please describe):	22	12.0	3	9.7	16	13.8	3	8.3
	Total N	183	100.0	31	100.0	116	100.0	36	100.0

Of districts that used the open-choice option to describe other technologies provided to middle school teachers to support remote learning in spring 2020, the most mentioned technologies were webcams, document cameras, and audio equipment like speakers, microphones, and headsets; it is clear that districts prioritized the provision of these technologies to aid the remote broadcast of instructional materials. A multitude of districts also reported that they provided additional desktop computers, PCs, and monitors.

#### Table E22. District-reported technology provided to high school teachers to support remote learning

District Inventory: Q37h. What technologies were provided to high school teachers to support remote teaching during the two timeframes listed?

						Distri	ct Type		
		Ov	rerall	Allianc	e districts	Non-Allia	nce districts	AP	SEPs
		Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid
		Count	Percent	Count	Percent	Count	Percent	Count	Percent
Spring 2020	Chromebooks	108	63.9	20	64.5	70	72.2	18	43.9
	iPads	23	13.6	3	9.7	10	10.3	10	24.4
	Laptops (other than Chromebooks)	104	61.5	22	71.0	51	52.6	31	75.6
	Smartphones	8	4.7	1	3.2	4	4.1	3	7.3
	Wifi hotspot devices	49	29.0	10	32.3	38	39.2	1	2.4
	Other (please describe):	13	7.7	2	6.5	9	9.3	2	4.9
	Total N	169	100.0	31	100.0	97	100.0	41	100.0
2020-2021	Chromebooks	110	64.0	18	58.1	70	72.2	22	50.0
	iPads	26	15.1	4	12.9	11	11.3	11	25.0
	Laptops (other than Chromebooks)	116	67.4	26	83.9	57	58.8	33	75.0
	Smartphones	8	4.7	1	3.2	4	4.1	3	6.8
	Wifi hotspot devices	56	32.6	13	41.9	40	41.2	3	6.8
	Other (please describe):	22	12.8	4	12.9	15	15.5	3	6.8
	Total N	172	100.0	31	100.0	97	100.0	44	100.0

Of districts that used the open-choice option to describe other technologies provided to high school teachers to support remote learning in spring 2020, the most-reported technologies were those used to broadcast virtual instruction, such as webcams, document cameras, microphones, headsets, and speakers to ensure quality streaming. Some districts also mentioned that they supplied additional desktop computers and monitors. Finally, it was reported by two districts that drawing/writing tablets were provided to some teachers to bolster instruction.

						Distri	ct Type		
		Ov	erall	Alliance	e districts	Non-Allia	nce districts	AP	SEPs
		Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid
		Count	Percent	Count	Percent	Count	Percent	Count	Percent
Spring 2020	Google Suite/Classroom	170	89.5	27	81.8	119	93.7	24	80.0
	Schoology	7	3.7	0	.0	7	5.5	0	.0
	Moodle	1	.5	0	.0	1	.8	0	.0
	ClassDojo	48	25.3	10	30.3	33	26.0	5	16.7
	SeeSaw	89	46.8	12	36.4	73	57.5	4	13.3
	Other (please describe):	17	8.9	4	12.1	7	5.5	6	20.0
	Total N	190	100.0	33	100.0	127	100.0	30	100.0
2020-2021	Google Suite/Classroom	169	88.9	26	78.8	119	93.0	24	82.8
	Schoology	9	4.7	0	.0	9	7.0	0	.0
	Moodle	1	.5	0	.0	1	.8	0	.0
	ClassDojo	44	23.2	9	27.3	30	23.4	5	17.2
	SeeSaw	98	51.6	19	57.6	75	58.6	4	13.8
	Other (please describe):	21	11.1	7	21.2	8	6.3	6	20.7
	Total N	190	100.0	33	100.0	128	100.0	29	100.0

**Table E23. District-reported learning management systems provided to elementary school teachers to support remote learning** *District Inventory: Q38e. What learning management systems were provided to elementary school teachers to support remote teaching during the two timeframes listed?* 

Of those districts that that used the open-text option to describe other learning management systems (LMS) provided to elementary school teachers to support remote learning, the most-reported LMS was Microsoft Teams, which can be used to facilitate the sharing of information and instructional materials. Another LMS mentioned was Nearpod (<u>https://nearpod.com/</u>), which allows teachers to assign interactive lessons, activities and assessments remotely. An additional LMS reported that covers multiple subjects was IXL (<u>https://www.ixl.com/</u>), which can be used to assign assignments and assessments over a wide variety of topics. Some districts reported LMS that are subject-specific, such as ASSISTments (<u>https://www.youtube.com/watch?v=8t62Aj-VGig</u>), a learning platform for math where teachers can assign homework and assessments and provide feedback. A final learning management system discussed was Transparent Classroom for Montessori (<u>https://www.transparentclassroom.com/</u>); this platform allows teachers to plan lessons, manage students and record their progress, and communicate with parents in real-time.

**Table E24. District-reported learning management systems provided to middle school teachers to support remote learning** *District Inventory: Q38m. What learning management systems were provided to middle school teachers to support remote teaching during the two timeframes listed?* 

						Distric	et Type		
		Ov	erall	Alliance	e districts	Non-Allia	nce districts	APSEPs	
		Valid Count	Valid Percent	Valid Count	Valid Percent	Valid Count	Valid Percent	Valid Count	Valid Percent
Spring 2020	Google Suite/Classroom	164	91.1	26	83.9	109	94.0	29	87.9
	Schoology	14	7.8	3	9.7	11	9.5	0	.0
	Moodle	7	3.9	3	9.7	4	3.4	0	.0
	ClassDojo	22	12.2	3	9.7	17	14.7	2	6.1
	SeeSaw	35	19.4	3	9.7	30	25.9	2	6.1
	Other (please describe):	19	10.6	5	16.1	9	7.8	5	15.2
	Total N	180	100.0	31	100.0	116	100.0	33	100.0
2020-2021	Google Suite/Classroom	162	89.0	25	83.3	108	90.8	29	87.9
	Schoology	17	9.3	3	10.0	14	11.8	0	.0
	Moodle	8	4.4	3	10.0	5	4.2	0	.0
	ClassDojo	21	11.5	3	10.0	16	13.4	2	6.1
	SeeSaw	35	19.2	4	13.3	29	24.4	2	6.1
	Other (please describe):	21	11.5	6	20.0	9	7.6	6	18.2
	Total N	182	100.0	30	100.0	119	100.0	33	100.0

Of those districts that used the open-text option to describe other learning management systems provided to middle school teachers to support remote learning, districts mentioned Microsoft Teams for facilitating communication and Nearpod for providing interactive lessons, activities, and assessments (https://nearpod.com/). One district mentioned the use of Unified Classroom (https://www.powerschool.com/blog/what-is-unified-classroom-2020/), which combines a learning management system with assessments and student performance analytics. Edgenuity is a learning management system that was reported on both the middle school and high school level, as it provides middle and high school courses to students fully-online, including access to teachers, assignments, and assessments (https://www.edgenuity.com/online-courses/). Finally, Transparent Classroom (https://www.transparentclassroom.com/) was mentioned for Montessori classrooms, and it can be used to plan lessons, manage students and track their progress, and communicate with parents in real time. There was one subject-specific learning management system that a district reported providing to middle school teachers, called ASSISTments, a math-specific platform where teachers can assign homework and assessments and provide feedback to students (https://www.youtube.com/watch?v=8t62Aj-VGig).

Table E25. District-reported learning management systems provided to high school teachers to support remote learning
District Inventory: Q38h. What Learning management systems were provided to high school teachers to support remote teaching
during the two timeframes listed?

						Distrie	et Type		
		Ov	erall	Alliance	e districts	Non-Allia	nce districts	AP	SEPs
		Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid
		Count	Percent	Count	Percent	Count	Percent	Count	Percent
Spring 2020	Google Suite/Classroom	147	88.6	26	83.9	91	92.9	30	81.1
	Schoology	20	12.0	3	9.7	15	15.3	2	5.4
	Moodle	7	4.2	3	9.7	4	4.1	0	.0
	ClassDojo	7	4.2	0	.0	6	6.1	1	2.7
	SeeSaw	10	6.0	0	.0	9	9.2	1	2.7
	Other (please describe):	22	13.3	6	19.4	9	9.2	7	18.9
	Total N	166	100.0	31	100.0	98	100.0	37	100.0
2020-2021	Google Suite/Classroom	146	86.4	25	83.3	89	89.9	32	80.0
	Schoology	21	12.4	3	10.0	17	17.2	1	2.5
	Moodle	8	4.7	3	10.0	5	5.1	0	.0
	ClassDojo	7	4.1	0	.0	6	6.1	1	2.5
	SeeSaw	9	5.3	0	.0	8	8.1	1	2.5
	Other (please describe):	25	14.8	8	26.7	8	8.1	9	22.5
	Total N	169	100.0	30	100.0	99	100.0	40	100.0

Of the districts that used the open-text option to describe other learning management systems (LMS) provided to high school teachers to support remote learning, 6 mentioned Microsoft Teams and 4 mentioned Nearpod. Microsoft Teams is used to facilitate the sharing of information and instructional materials. Whereas, Nearpod provides interactive lessons, activities, and students assessments (<u>https://nearpod.com/</u>). Unified Classroom was mentioned as a tool for combining the functions of an LMS with assignments, assessments, and student performance analytics (<u>https://www.powerschool.com/blog/what-is-unified-classroom-2020/</u>). Edgenuity was also reported; it provides credited courses across a wide range of subjects and allows students to have virtual access to teachers, coursework, and assessments (<u>https://www.edgenuity.com/online-courses/</u>). One district reported that they provided Buzz, which allows teachers to track progress, personalize learning, and administer assessments. (<u>https://agilix.com/buzz-learning-delivery-platform/#:~:text=Buzz%20supports%20successful%20learning%20and,your%20ideas%20for%20transforming%20education</u>)

**Table E26. District-reported apps and tools used by elementary school teachers during spring 2020 and school year 2020-2021** District Inventory: Q39e. Which of these were the most-used apps and tools for elementary school teachers during the two timeframes listed?

						Distrie	et Type		
		Ov	erall	Alliance	e districts	Non-Allia	nce districts	AP	SEPs
		Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid
		Count	Percent	Count	Percent	Count	Percent	Count	Percent
Spring 2020	YouTube video	130	70.3	23	71.9	85	69.1	22	73.3
	Desmos	12	6.5	5	15.6	7	5.7	0	.0
	Edpuzzle	43	23.2	10	31.3	31	25.2	2	6.7
	Google Forms	138	74.6	23	71.9	96	78.0	19	63.3
	Kahoot	86	46.5	12	37.5	60	48.8	14	46.7
	ClassDojo	73	39.5	19	59.4	47	38.2	7	23.3
	Mentimeter	2	1.1	0	.0	2	1.6	0	.0
	Quizlet	67	36.2	9	28.1	48	39.0	10	33.3
	Padlet	56	30.3	10	31.3	44	35.8	2	6.7
	Screencastify	87	47.0	16	50.0	69	56.1	2	6.7
	Padlet/Jamboard	76	41.1	15	46.9	56	45.5	5	16.7
	Other (please describe):	50	27.0	9	28.1	33	26.8	8	26.7
	Total N	185	100.0	32	100.0	123	100.0	30	100.0
2020-2021	YouTube video	131	70.1	21	63.6	87	70.2	23	76.7
	Desmos	18	9.6	7	21.2	11	8.9	0	.0
	Edpuzzle	54	28.9	12	36.4	41	33.1	1	3.3
	Google Forms	146	78.1	24	72.7	103	83.1	19	63.3
	Kahoot	91	48.7	13	39.4	64	51.6	14	46.7
	ClassDojo	74	39.6	21	63.6	45	36.3	8	26.7
	Mentimeter	4	2.1	2	6.1	2	1.6	0	.0
	Quizlet	77	41.2	9	27.3	56	45.2	12	40.0
	Padlet	73	39.0	14	42.4	57	46.0	2	6.7
	Screencastify	101	54.0	17	51.5	81	65.3	3	10.0
	Padlet/Jamboard	102	54.5	19	57.6	76	61.3	7	23.3
	Other (please describe):	54	28.9	11	33.3	35	28.2	8	26.7
	Total N	187	100.0	33	100.0	124	100.0	30	100.0

**Table E27. District-reported apps and tools used by middle school teachers during spring 2020 and school year 2020-2021** *District Inventory: Q39m. Which of these were the most-used apps and tools for middle school teachers during the two timeframes listed?* 

						Distri	ct Type		
		Ov	erall	Alliance	e districts	Non-Allia	nce districts	APSEPs	
		Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid
		Count	Percent	Count	Percent	Count	Percent	Count	Percent
Spring 2020	YouTube video	146	81.1	26	83.9	92	80.7	28	80.0
	Desmos	31	17.2	6	19.4	24	21.1	1	2.9
	Edpuzzle	65	36.1	14	45.2	49	43.0	2	5.7
	Google Forms	140	77.8	23	74.2	93	81.6	24	68.6
	Kahoot	95	52.8	14	45.2	66	57.9	15	42.9
	ClassDojo	32	17.8	5	16.1	23	20.2	4	11.4
	Mentimeter	5	2.8	1	3.2	4	3.5	0	.0
	Quizlet	75	41.7	11	35.5	53	46.5	11	31.4
	Padlet	54	30.0	12	38.7	41	36.0	1	2.9
	Screencastify	79	43.9	17	54.8	61	53.5	1	2.9
	Padlet/Jamboard	70	38.9	14	45.2	51	44.7	5	14.3
	Other (please describe):	50	27.8	9	29.0	31	27.2	10	28.6
	Total N	180	100.0	31	100.0	114	100.0	35	100.0
2020-2021	YouTube video	149	82.3	27	87.1	93	80.9	29	82.9
	Desmos	38	21.0	6	19.4	31	27.0	1	2.9
	Edpuzzle	75	41.4	13	41.9	58	50.4	4	11.4
	Google Forms	147	81.2	24	77.4	99	86.1	24	68.6
	Kahoot	98	54.1	14	45.2	68	59.1	16	45.7
	ClassDojo	30	16.6	5	16.1	20	17.4	5	14.3
	Mentimeter	6	3.3	2	6.5	4	3.5	0	.0
	Quizlet	82	45.3	13	41.9	55	47.8	14	40.0
	Padlet	75	41.4	18	58.1	55	47.8	2	5.7
	Screencastify	101	55.8	18	58.1	81	70.4	2	5.7
	Padlet/Jamboard	97	53.6	20	64.5	71	61.7	6	17.1
	Other (please describe):	54	29.8	11	35.5	34	29.6	9	25.7
	Total N	181	100.0	31	100.0	115	100.0	35	100.0

#### Table E28. District-reported apps and tools used by high school teachers during spring 2020 and 2020-21

District Inventory: Q39h. Which of these were the most-used apps and tools for high school teachers during the two timeframes listed?

						Distri	ct Type		
		Ov	erall	Alliance	e districts	Non-Allia	nce districts	APSEPs	
		Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid
		Count	Percent	Count	Percent	Count	Percent	Count	Percent
Spring 2020	YouTube video	139	84.2	27	87.1	79	83.2	33	84.6
	Desmos	41	24.8	6	19.4	34	35.8	1	2.6
	Edpuzzle	63	38.2	16	51.6	44	46.3	3	7.7
	Google Forms	130	78.8	23	74.2	82	86.3	25	64.1
	Kahoot	90	54.5	13	41.9	63	66.3	14	35.9
	ClassDojo	15	9.1	1	3.2	11	11.6	3	7.7
	Mentimeter	6	3.6	1	3.2	5	5.3	0	.0
	Quizlet	76	46.1	12	38.7	52	54.7	12	30.8
	Padlet	50	30.3	12	38.7	37	38.9	1	2.6
	Screencastify	73	44.2	18	58.1	53	55.8	2	5.1
	Padlet/Jamboard	72	43.6	16	51.6	50	52.6	6	15.4
	Other (please describe):	39	23.6	10	32.3	19	20.0	10	25.6
	Total N	165	100.0	31	100.0	95	100.0	39	100.0
2020-2021	YouTube video	144	85.2	28	90.3	82	85.4	34	81.0
	Desmos	46	27.2	6	19.4	38	39.6	2	4.8
	Edpuzzle	77	45.6	17	54.8	55	57.3	5	11.9
	Google Forms	139	82.2	24	77.4	88	91.7	27	64.3
	Kahoot	96	56.8	14	45.2	65	67.7	17	40.5
	ClassDojo	13	7.7	1	3.2	9	9.4	3	7.1
	Mentimeter	8	4.7	3	9.7	5	5.2	0	.0
	Quizlet	88	52.1	15	48.4	59	61.5	14	33.3
	Padlet	74	43.8	18	58.1	53	55.2	3	7.1
	Screencastify	95	56.2	22	71.0	70	72.9	3	7.1
	Padlet/Jamboard	92	54.4	20	64.5	64	66.7	8	19.0
	Other (please describe):	44	26.0	12	38.7	23	24.0	9	21.4
	Total N	169	100.0	31	100.0	96	100.0	42	100.0

						Distric	et Type		
		Ov	erall	Alliance	e districts	Non-Allia	nce districts	APS	SEPs
		Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid
		Count	Percent	Count	Percent	Count	Percent	Count	Percent
Elementary	No, we did not have that type of system	114	60.6	12	36.4	76	61.3	26	83.9
School	Yes, we had that type of system, but we didn't use the analytics	30	16.0	9	27.3	19	15.3	2	6.5
	Yes, we had that type of system, and we used the analytics to some extent	33	17.6	8	24.2	22	17.7	3	9.7
	Yes, we had that type of system, and we used the analytics extensively	11	5.9	4	12.1	7	5.6	0	.0
	Total N	188	100.0	33	100.0	124	100.0	31	100.0
Middle	No, we did not have that type of system	9	47.4	2	28.6	7	58.3	0	.0
School	Yes, we had that type of system, but we didn't use the analytics	6	31.6	3	42.9	3	25.0	0	.0
	Yes, we had that type of system, and we used the analytics to some extent	3	15.8	1	14.3	2	16.7	0	.0
	Yes, we had that type of system, and we used the analytics extensively	1	5.3	1	14.3	0	.0	0	.0
	Total N	19	100.0	7	100.0	12	100.0	0	.0
High School	No, we did not have that type of system	97	58.1	11	36.7	55	56.7	31	77.5
	Yes, we had that type of system, but we didn't use the analytics	32	19.2	9	30.0	19	19.6	4	10.0
	Yes, we had that type of system, and we used the analytics to some extent	33	19.8	8	26.7	20	20.6	5	12.5
	Yes, we had that type of system, and we used the analytics extensively	5	3.0	2	6.7	3	3.1	0	.0
	Total N	167	100.0	30	100.0	97	100.0	40	100.0

#### Table E29. District-reported single sign-on/app management systems used during spring 2020 by grade level

District Inventory Q40emh\_1. During the two timeframes listed, did your district use a single sign-on or similar app management system (for example, Clever SSO) that can track teachers' and students' use of learning apps/tools at the following levels?

						Distrie	ct Type		
		Ov	erall	Alliance	e districts	Non-Allia	nce districts	APS	SEPs
		Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid
		Count	Percent	Count	Percent	Count	Percent	Count	Percent
Elementary	No, we did not have that type of system	84	44.9	8	24.2	54	43.5	22	73.3
School	Yes, we had that type of system, but we didn't use the analytics	32	17.1	7	21.2	23	18.5	2	6.7
	Yes, we had that type of system, and we used the analytics to some extent	51	27.3	13	39.4	32	25.8	6	20.0
	Yes, we had that type of system, and we used the analytics extensively	20	10.7	5	15.2	15	12.1	0	.0
	Total N	187	100.0	33	100.0	124	100.0	30	100.0
Middle	No, we did not have that type of system	7	36.8	2	28.6	5	41.7	0	.0
School	Yes, we had that type of system, but we didn't use the analytics	5	26.3	2	28.6	3	25.0	0	.0
	Yes, we had that type of system, and we used the analytics to some extent	6	31.6	2	28.6	4	33.3	0	.0
	Yes, we had that type of system, and we used the analytics extensively	1	5.3	1	14.3	0	.0	0	.0
	Total N	19	100.0	7	100.0	12	100.0	0	.0
High School	No, we did not have that type of system	83	49.4	9	29.0	44	45.8	30	73.2
-	Yes, we had that type of system, but we didn't use the analytics	24	14.3	6	19.4	16	16.7	2	4.9
	Yes, we had that type of system, and we used the analytics to some extent	51	30.4	12	38.7	30	31.3	9	22.0
	Yes, we had that type of system, and we used the analytics extensively	10	6.0	4	12.9	6	6.3	0	.0
	Total N	168	100.0	31	100.0	96	100.0	41	100.0

#### Table E30. District-reported single sign-on/app management systems used during 2020-21 by grade level

District Inventory Q40emh\_2. During the two timeframes listed, did your district's EDUs use a single sign-on or similar app management system (for example, Clever SSO) that can track teachers' and students' use of learning apps/tools?

**Table E31. District-reported summer 2020 preparation for fall 2020: Online resources and learning management platforms** *District Inventory: Q15\_3, Q15\_4. Which of the following activities did your district conduct between the last student day of spring 2020 and the students return to school in fall 2020?* 

		District Type								
	Overall		Allianc	Alliance districts		Non-Alliance districts		SEPs		
	Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid		
	Count	Percent	Count	Percent	Count	Percent	Count	Percent		
Creating online resources for teachers	206	92.4	31	96.9	131	92.9	44	88.0		
Adopting new learning management platforms	163	73.1	23	71.9	104	73.8	36	72.0		
None of the above	9	4.0	1	3.1	4	2.8	4	8.0		
Total N	223	100.0	32	100.0	141	100.0	50	100.0		

					Distric	et Type	
		Ov	rerall	Allianc	e districts	Non-Allia	nce districts
		Valid	Valid	Valid	Valid	Valid	Valid
		Count	Percent	Count	Percent	Count	Percent
Learning management	Extremely inadequate	84	13.6	46	17.4	38	10.8
system(s)	Somewhat inadequate	109	17.7	48	18.2	61	17.3
	Neither adequate nor inadequate	30	4.9	20	7.6	10	2.8
	Somewhat adequate	201	32.6	84	31.8	117	33.1
	Extremely adequate	193	31.3	66	25.0	127	36.0
	Total N	617	100.0	264	100.0	353	100.0
Learning apps	Extremely inadequate	80	13.0	44	16.7	36	10.2
	Somewhat inadequate	132	21.4	61	23.1	71	20.2
	Neither adequate nor inadequate	67	10.9	36	13.6	31	8.8
	Somewhat adequate	192	31.2	74	28.0	118	33.5
	Extremely adequate	145	23.5	49	18.6	96	27.3
	Total N	616	100.0	264	100.0	352	100.0
Hardware/software for	Extremely inadequate	166	27.0	93	35.2	73	20.8
concurrent hybrid instruction	Somewhat inadequate	159	25.9	66	25.0	93	26.5
	Neither adequate nor inadequate	72	11.7	39	14.8	33	9.4
	Somewhat adequate	124	20.2	41	15.5	83	23.6
	Extremely adequate	94	15.3	25	9.5	69	19.7
	Total N	615	100.0	264	100.0	351	100.0

### Table E32. Teacher-reported access to instructional technology in spring 2020 (elementary teachers)Teacher Survey Q19\_2a - Q19\_4a. How adequate was your access to each of the following technologies during spring 2020?

					Distric	et Type	
		Ov	verall	Allianc	e districts	Non-Allia	nce districts
	_	Valid	Valid	Valid	Valid	Valid	Valid
		Count	Percent	Count	Percent	Count	Percent
Learning management	Extremely inadequate	18	2.8	9	3.3	9	2.5
system(s)	Somewhat inadequate	55	8.6	27	9.9	28	7.7
	Neither adequate nor inadequate	42	6.6	21	7.7	21	5.7
	Somewhat adequate	199	31.1	101	37.0	98	26.8
	Extremely adequate	325	50.9	115	42.1	210	57.4
	Total N	639	100.0	273	100.0	366	100.0
Learning apps	Extremely inadequate	17	2.7	10	3.7	7	1.9
	Somewhat inadequate	58	9.1	33	12.1	25	6.8
	Neither adequate nor inadequate	75	11.7	34	12.5	41	11.2
	Somewhat adequate	233	36.5	108	39.6	125	34.2
	Extremely adequate	256	40.1	88	32.2	168	45.9
	Total N	639	100.0	273	100.0	366	100.0
Hardware/software for	Extremely inadequate	64	10.0	44	16.1	20	5.5
concurrent hybrid	Somewhat inadequate	107	16.7	57	20.9	50	13.7
instruction	Neither adequate nor inadequate	83	13.0	32	11.7	51	13.9
	Somewhat adequate	191	29.9	83	30.4	108	29.5
	Extremely adequate	194	30.4	57	20.9	137	37.4
	Total N	639	100.0	273	100.0	366	100.0

Table E33. Teacher-reported access to instructional technology in 2020-21 (elementary teachers)Teacher Survey Q19\_2b - Q19\_4b. How adequate was technology access for elementary school teachers in 2020-21?

					Distric	et Type		
		Ov	verall	Allianc	e districts	Non-Alliance districts		
	_	Valid	Valid	Valid	Valid	Valid	Valid	
		Count	Percent	Count	Percent	Count	Percent	
Learning management	Extremely inadequate	17	4.6	8	6.8	9	3.6	
system(s)	Somewhat inadequate	40	10.8	19	16.1	21	8.4	
	Neither adequate nor inadequate	18	4.9	7	5.9	11	4.4	
	Somewhat adequate	111	30.1	33	28.0	78	31.1	
	Extremely adequate	183	49.6	51	43.2	132	52.6	
	Total N	369	100.0	118	100.0	251	100.0	
Learning apps	Extremely inadequate	28	7.6	17	14.4	11	4.4	
	Somewhat inadequate	55	14.9	21	17.8	34	13.5	
	Neither adequate nor inadequate	41	11.1	14	11.9	27	10.8	
	Somewhat adequate	122	33.1	35	29.7	87	34.7	
	Extremely adequate	123	33.3	31	26.3	92	36.7	
	Total N	369	100.0	118	100.0	251	100.0	
Hardware/software for	Extremely inadequate	59	16.0	23	19.5	36	14.3	
concurrent hybrid	Somewhat inadequate	93	25.2	29	24.6	64	25.5	
instruction	Neither adequate nor inadequate	59	16.0	18	15.3	41	16.3	
	Somewhat adequate	98	26.6	30	25.4	68	27.1	
	Extremely adequate	60	16.3	18	15.3	42	16.7	
	Total N	369	100.0	118	100.0	251	100.0	

# Table E34. Teacher-reported access to instructional technology in spring 2020 (middle school teachers)Teacher Survey Q19\_2a - Q19\_4a. How adequate was your access to each of the following technologies during spring 2020?

					Distric	et Type	
		Ov	verall	Allianc	e districts	Non-Alliance districts	
		Valid	Valid Persont	Valid Count	Valid Persont	Valid Count	Valid Paraant
looming management	Extramely inadequate	7	1.9				1.6
system(s)	Somewhat incloquate	/	1.0	5	2.4	4	1.0
	Somewhat madequate	11	2.9	0	4.9	3	1.9
	Neither adequate nor inadequate	14	3.7	6	4.9	8	3.1
	Somewhat adequate	102	26.8	34	27.6	68	26.5
	Extremely adequate	246	64.7	74	60.2	172	66.9
	Total N	380	100.0	123	100.0	257	100.0
learning apps	Extremely inadequate	8	2.1	5	4.1	3	1.2
	Somewhat inadequate	20	5.2	9	7.3	11	4.3
	Neither adequate nor inadequate	26	6.8	9	7.3	17	6.6
	Somewhat adequate	145	38.1	46	37.4	99	38.4
	Extremely adequate	182	47.8	54	43.9	128	49.6
	Total N	381	100.0	123	100.0	258	100.0
hardware/software for	Extremely inadequate	24	6.3	11	8.9	13	5.0
concurrent hybrid	Somewhat inadequate	60	15.7	22	17.9	38	14.7
instruction	Neither adequate nor inadequate	40	10.5	16	13.0	24	9.3
	Somewhat adequate	132	34.6	32	26.0	100	38.8
	Extremely adequate	125	32.8	42	34.1	83	32.2
	Total N	381	100.0	123	100.0	258	100.0

# Table E35. Teacher-reported access to instructional technology in 2020-21 (middle school teachers) Teacher Survey Q19\_2b - Q19\_4b. How adequate was technology access for middle school teachers in 2020-21?
			District Type								
		Ov	erall	Allianc	e districts	Non-Alliance districts					
		Valid Valid		Valid Valid		Valid	Valid				
		Count	Percent	Count	Percent	Count	Percent				
learning management	Extremely inadequate	31	5.4	19	10.7	12	3.0				
system(s)	Somewhat inadequate	52	9.1	16	9.0	36	9.1				
	Neither adequate nor inadequate	29	5.1	13	7.3	16	4.1				
	Somewhat adequate	189	33.0	57	32.0	132	33.5				
	Extremely adequate	271	47.4	73	41.0	198	50.3				
	Total N	572	100.0	178	100.0	394	100.0				
learning apps	Extremely inadequate	38	6.6	22	12.4	16	4.0				
	Somewhat inadequate	68	11.8	23	12.9	45	11.4				
	Neither adequate nor inadequate	83	14.5	22	12.4	61	15.4				
	Somewhat adequate	194	33.8	66	37.1	128	32.3				
	Extremely adequate	191	33.3	45	25.3	146	36.9				
	Total N	574	100.0	178	100.0	396	100.0				
hardware/software for	Extremely inadequate	104	18.2	48	27.0	56	14.2				
concurrent hybrid instruction	Somewhat inadequate	118	20.6	39	21.9	79	20.0				
	Neither adequate nor inadequate	89	15.5	28	15.7	61	15.4				
	Somewhat adequate	158	27.6	43	24.2	115	29.1				
	Extremely adequate	104	18.2	20	11.2	84	21.3				
	Total N	573	100.0	178	100.0	395	100.0				

# Table E36. Teacher-reported access to instructional technology in spring 2020 (high school teachers)Teacher Survey Q19\_2a - Q19\_4a. How adequate was your access to each of the following technologies during spring 2020?

			District Type								
		Ov	erall	Allianc	e districts	Non-Allia	nce districts				
		Valid Valid		Valid	Valid	Valid	Valid				
		Count	Percent	Count	Percent	Count	Percent				
learning management	Extremely inadequate	12	2.1	5	2.8	7	1.8				
system(s)	Somewhat inadequate	25	4.4	9	5.1	16	4.1				
	Neither adequate nor inadequate	20	3.5	11	6.2	9	2.3				
	Somewhat adequate	162	28.3	61	34.5	101	25.6				
	Extremely adequate	353	61.7	91	51.4	262	66.3				
	Total N	572	100.0	177	100.0	395	100.0				
learning apps	Extremely inadequate	17	3.0	9	5.1	8	2.0				
	Somewhat inadequate	36	6.3	14	7.9	22	5.6				
	Neither adequate nor inadequate	53	9.3	19	10.7	34	8.6				
	Somewhat adequate	207	36.2	72	40.7	135	34.2				
	Extremely adequate	259	45.3	63	35.6	196	49.6				
	Total N	572	100.0	177	100.0	395	100.0				
hardware/software for	Extremely inadequate	49	8.6	24	13.6	25	6.3				
concurrent hybrid instruction	Somewhat inadequate	86	15.0	33	18.6	53	13.4				
	Neither adequate nor inadequate	63	11.0	15	8.5	48	12.2				
	Somewhat adequate	199	34.8	66	37.3	133	33.7				
	Extremely adequate	175	30.6	39	22.0	136	34.4				
	Total N	572	100.0	177	100.0	395	100.0				

# Table E37. Teacher-reported access to instructional technology in 2020-21 (for high school teachers) Teacher Survey Q19\_2b - Q19\_4b. How adequate was technology access for high school teachers in 2020-21?

		District Type								
		Ov	verall	Allianc	e districts	Non-Allia	nce districts			
		Valid Valid		Valid Valid		Valid	Valid			
		Count	Percent	Count	Percent	Count	Percent			
learning management	Extremely inadequate	12	5.9	9	13.8	3	2.2			
system(s)	Somewhat inadequate	27	13.3	11	16.9	16	11.6			
	Neither adequate nor inadequate	17	8.4	9	13.8	8	5.8			
	Somewhat adequate	56	27.6	17	26.2	39	28.3			
	Extremely adequate	91	44.8	19	29.2	72	52.2			
	Total N	203	100.0	65	100.0	138	100.0			
learning apps	Extremely inadequate	17	8.4	8	12.3	9	6.5			
	Somewhat inadequate	31	15.3	13	20.0	18	13.0			
	Neither adequate nor inadequate	28	13.8	11	16.9	17	12.3			
	Somewhat adequate	67	33.0	21	32.3	46	33.3			
	Extremely adequate	60	29.6	12	18.5	48	34.8			
	Total N	203	100.0	65	100.0	138	100.0			
hardware/software for	Extremely inadequate	32	15.8	14	21.5	18	13.1			
concurrent hybrid instruction	Somewhat inadequate	43	21.3	12	18.5	31	22.6			
	Neither adequate nor inadequate	36	17.8	13	20.0	23	16.8			
	Somewhat adequate	52	25.7	19	29.2	33	24.1			
	Extremely adequate	39	19.3	7	10.8	32	23.4			
	Total N	202	100.0	65	100.0	137	100.0			

# Table E38. Teacher-reported access to instructional technology in spring 2020 (mixed-level teachers) Teacher Survey Q19\_2a - Q19\_4a. How adequate was your access to each of the following technologies during spring 2020?

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		District Type								
		Ov	verall	Allianc	e districts	Non-Allia	nce districts			
		Valid Valid		Valid	Valid	Valid	Valid			
		Count	Percent	Count	Percent	Count	Percent			
learning management	Extremely inadequate	3	1.4	1	1.5	2	1.4			
system(s)	Somewhat inadequate	13	6.2	7	10.4	6	4.2			
	Neither adequate nor inadequate	8	3.8	5	7.5	3	2.1			
	Somewhat adequate	66	31.3	25	37.3	41	28.5			
	Extremely adequate	121	57.3	29	43.3	92	63.9			
	Total N	211	100.0	67	100.0	144	100.0			
learning apps	Extremely inadequate	3	1.4	1	1.5	2	1.4			
	Somewhat inadequate	17	8.1	10	14.9	7	4.9			
	Neither adequate nor inadequate	26	12.3	11	16.4	15	10.4			
	Somewhat adequate	67	31.8	23	34.3	44	30.6			
	Extremely adequate	98	46.4	22	32.8	76	52.8			
	Total N	211	100.0	67	100.0	144	100.0			
hardware/software for	Extremely inadequate	11	5.2	7	10.4	4	2.8			
concurrent hybrid instruction	Somewhat inadequate	23	11.0	10	14.9	13	9.1			
	Neither adequate nor inadequate	32	15.2	12	17.9	20	14.0			
	Somewhat adequate	71	33.8	26	38.8	45	31.5			
	Extremely adequate	73	34.8	12	17.9	61	42.7			
	Total N	210	100.0	67	100.0	143	100.0			

### Table E39. Teacher-reported access to instructional technology in 2020-21 (mixed-level teachers)Teacher Survey Q19\_2b - Q19\_4b. How adequate was technology access for mixed-level teachers in 2020-21?

### **Table E40. Teacher-reported technological resources provided by districts/schools to support remote and hybrid learning** *Teacher survey Q36. Is there anything else you'd like to share about your experiences as a Connecticut teacher during the COVID-19 pandemic?*

Through the open-ended teacher survey question, teacher survey respondents reported that their districts provided a variety of technology resources including Google Classroom, Seesaw, Google Translate, IXL, Kahoot, Google Meet, and Screencastify. In general, respondents reported that they did not receive adequate training on these technologies, which made implementing them in the classroom challenging. Despite this, many teachers reported that they became more proficient with using various technologies over time. Other respondents reported that they received no technology resources. Some of these teachers used their personal funds to buy the equipment needed to instruct students. Teachers who received minimal technological resources from their districts reported utilizing, they utilized free online resources like Edpuzzle and Kahoot. One teacher said, "Canva, The New York Times, Penny Kittle, Kelly Gallagher, and many researchers on Twitter offered amazing insight and ideas." Responses indicate that access to the internet and technology devices was uneven among districts. Some teachers said that the WiFi in their school building was unstable, leading to frequent interruptions. Other teachers reported that those districts who were already using instructional technology before the pandemic fared better than those that weren't. Several teachers reported that their district grew to use instructional technology more effectively during the pandemic. One teacher said, "Our district was moving towards incorporating more technology in the classroom prior to Covid. Covid sped the process up (e.g., we now have 1 to 1 devices, more student-paced learning, etc.) which does benefit us now that we are seeing a more normal school year. It was painful, but I think in the long run, instruction will benefit."

# Research Question 3c. What types and amount of professional development did districts/schools provide to teachers to support remote and hybrid learning (e.g., training on education technology, pedagogy of virtual teaching, etc.)?

**Table E41. District-reported hours of paid professional development devoted to remote/virtual learning during spring 2020** *District Inventory Q10. During spring 2020, approximately how many hours of district-provided paid teacher professional development/training were devoted to strategies and skills for remote/virtual learning? Please consider only PD/training provided by the district during paid time and select the best response below that includes the total number of hours per teacher.* 

		District Type							
	Ov	erall	Allianc	e districts	Non-Allia	nce districts	APSEPs		
	Valid	Valid Valid		Valid Valid		Valid	Valid	Valid	
	Count	Percent	Count	Percent	Count	Percent	Count	Percent	
None	18	8.3	4	13.3	11	8.0	3	6.0	
1-6 hours	61	28.0	6	20.0	33	23.9	22	44.0	
7-12 hours	56	25.7	11	36.7	34	24.6	11	22.0	
13-18 hours	37	17.0	3	10.0	25	18.1	9	18.0	
19-30 hours	20	9.2	3	10.0	14	10.1	3	6.0	
31+ hours	26	11.9	3	10.0	21	15.2	2	4.0	
Total N	218	100.0	30	100.0	138	100.0	50	100.0	

### Table E42. District-reported summer 2020 preparation for fall 2020: paid professional and voluntary development

District Inventory: Q15\_7, Q15\_8, Q15\_9, Q15\_10. Which of the following activities did your district conduct between the last student day of spring 2020 and the students return to school in fall 2020?

					District Type					
	Ov	erall	Alliance	e districts	Non-Alliance districts		AP	SEPs		
	Valid Valid		Valid	Valid	Valid	Valid	Valid	Valid		
	Count	Percent	Count	Percent	Count	Percent	Count	Percent		
Paid professional development related to learning technology	163	73.1	27	84.4	105	74.5	31	62.0		
Paid professional development related to strategies for remote teaching	158	70.9	26	81.3	102	72.3	30	60.0		
Voluntary workshops related to learning technology	130	58.3	21	65.6	93	66.0	16	32.0		
Voluntary workshops related to strategies for remote teaching	122	54.7	19	59.4	86	61.0	17	34.0		
Other (please describe)	45	20.2	11	34.4	29	20.6	5	10.0		
None of the above	21	9.4	4	12.5	11	7.8	6	12.0		
Total N	223	100.0	32	100.0	141	100.0	50	100.0		

Of the 45 districts that indicated that they used other strategies to prepare for the 2020-21 school year, several reported activities related to teacher professional development. Districts reported that they offered webinars and workshops on social-emotional learning, trauma support, technology, and other topics. Other districts reported using online sessions and lists of resources to help prepare staff for the new year. Some districts reported that they made adjustments to the school schedule or the curriculum to account for changes in learning format. Some districts reported that they extended the school year in person and offered summer school and credit recovery both remotely and in-person.

### Table E43. District-report hours of paid professional development devoted to remote and/or hybrid instruction in 2020-21 by grade level

District Inventory Q18emh. During the 2020-21 contract year, approximately how many hours of district-provided paid teacher professional development were devoted to strategies for remote and/or hybrid instruction? Please consider only PD/training provided by the district during paid time and select the best response below that includes the total number of hours per teacher for each school level.

			District Type										
		Ov	rerall	Allianc	e districts	Non-Allia	nce districts	AP	SEPs				
		Valid Count	Valid Percent	Valid Count	Valid Percent	Valid Count	Valid Percent	Valid Count	Valid Percent				
Elementary School	None	10	5.2	2	6.3	5	4.0	3	9.1				
	1-6 hours	48	25.1	6	18.8	24	19.0	18	54.5				
	7-12 hours	43	22.5	6	18.8	34	27.0	3	9.1				
	13-18 hours	35	18.3	4	12.5	27	21.4	4	12.1				
	19-30 hours	26	13.6	6	18.8	16	12.7	4	12.1				
	31+ hours	29	15.2	8	25.0	20	15.9	1	3.0				
	Total N	191	100.0	32	100.0	126	100.0	33	100.0				
Middle School	None	7	3.8	2	6.7	3	2.6	2	5.4				
	1-6 hours	46	25.3	5	16.7	19	16.5	22	59.5				
	7-12 hours	44	24.2	5	16.7	35	30.4	4	10.8				
	13-18 hours	30	16.5	4	13.3	22	19.1	4	10.8				
	19-30 hours	23	12.6	5	16.7	14	12.2	4	10.8				
	31+ hours	32	17.6	9	30.0	22	19.1	1	2.7				
	Total N	182	100.0	30	100.0	115	100.0	37	100.0				
High School	None	5	3.0	1	3.4	2	2.1	2	4.8				
	1-6 hours	41	24.7	6	20.7	11	11.6	24	57.1				
	7-12 hours	37	22.3	5	17.2	26	27.4	6	14.3				
	13-18 hours	31	18.7	3	10.3	23	24.2	5	11.9				
	19-30 hours	20	12.0	5	17.2	11	11.6	4	9.5				
	31+ hours	32	19.3	9	31.0	22	23.2	1	2.4				
	Total N	166	100.0	29	100.0	95	100.0	42	100.0				

### Tables E44. Teacher-reported professional development over the past 5 years (elementary teachers)

Teacher Survey Q22. How would you rate the amount of professional development you completed in the following areas over the past 5 years? (Consider professional development you completed on your own as well as professional development offered by your district.)

					Distric	et Type	
		O	verall	Allianc	e districts	Non-Allia	nce districts
		Valid	Valid	Valid	Valid	Valid	Valid
		Count	Percent	Count	Percent	Count	Percent
Learning management system	Much less than I needed	234	23.9	103	25.1	131	23.0
	Somewhat less than I needed	237	24.2	92	22.4	145	25.5
	About the amount I needed	372	38.0	144	35.1	228	40.1
	Somewhat more than I needed	90	9.2	47	11.5	43	7.6
	Much more than I needed	46	4.7	24	5.9	22	3.9
	Total N	979	100.0	410	100.0	569	100.0
Online instructional materials	Much less than I needed	256	26.2	105	25.7	151	26.5
for your curriculum content	Somewhat less than I needed	295	30.2	121	29.7	174	30.6
	About the amount I needed	314	32.1	132	32.4	182	32.0
	Somewhat more than I needed	71	7.3	29	7.1	42	7.4
	Much more than I needed	41	4.2	21	5.1	20	3.5
	Total N	977	100.0	408	100.0	569	100.0
Supporting social-emotional	Much less than I needed	349	35.7	140	34.2	209	36.8
learning during remote/hybrid	Somewhat less than I needed	276	28.2	117	28.6	159	28.0
instruction	About the amount I needed	253	25.9	105	25.7	148	26.1
	Somewhat more than I needed	63	6.4	30	7.3	33	5.8
	Much more than I needed	36	3.7	17	4.2	19	3.3
	Total N	977	100.0	409	100.0	568	100.0
Other strategies and skills for	Much less than I needed	260	39.1	104	38.5	156	39.5
remote/hybrid instruction	Somewhat less than I needed	138	20.8	56	20.7	82	20.8
(please describe):	About the amount I needed	215	32.3	86	31.9	129	32.7
	Somewhat more than I needed	34	5.1	17	6.3	17	4.3
	Much more than I needed	18	2.7	7	2.6	11	2.8
	Total N	665	100.0	270	100.0	395	100.0

### Tables E45. Teacher-reported professional development over the past 5 years (middle school teachers)

Teacher Survey Q22. How would you rate the amount of professional development you completed in the following areas over the past 5 years? (Consider professional development you completed on your own as well as professional development offered by your district.)

·					Distric	et Type	
	_	O	verall	Alliance	e districts	Non-Allia	nce districts
	_	Valid	Valid	Valid	Valid	Valid	Valid
		Count	Percent	Count	Percent	Count	Percent
Learning management system	Much less than I needed	93	16.6	29	16.1	64	16.8
	Somewhat less than I needed	130	23.2	39	21.7	91	23.9
	About the amount I needed	266	47.5	89	49.4	177	46.6
	Somewhat more than I needed	46	8.2	16	8.9	30	7.9
	Much more than I needed	25	4.5	7	3.9	18	4.7
	Total N	560	100.0	180	100.0	380	100.0
Online instructional materials	Much less than I needed	119	21.3	34	18.9	85	22.4
for your curriculum content	Somewhat less than I needed	160	28.6	52	28.9	108	28.4
	About the amount I needed	225	40.2	82	45.6	143	37.6
	Somewhat more than I needed	38	6.8	6	3.3	32	8.4
	Much more than I needed	18	3.2	6	3.3	12	3.2
	Total N	560	100.0	180	100.0	380	100.0
Supporting social-emotional	Much less than I needed	172	30.8	57	31.8	115	30.3
learning during remote/hybrid	Somewhat less than I needed	164	29.3	45	25.1	119	31.3
instruction	About the amount I needed	154	27.5	55	30.7	99	26.1
	Somewhat more than I needed	42	7.5	12	6.7	30	7.9
	Much more than I needed	27	4.8	10	5.6	17	4.5
	Total N	559	100.0	179	100.0	380	100.0
Other strategies and skills for	Much less than I needed	129	33.9	35	30.7	94	35.3
remote/hybrid instruction	Somewhat less than I needed	94	24.7	25	21.9	69	25.9
(please describe):	About the amount I needed	135	35.5	44	38.6	91	34.2
	Somewhat more than I needed	14	3.7	6	5.3	8	3.0
	Much more than I needed	8	2.1	4	3.5	4	1.5
	Total N	380	100.0	114	100.0	266	100.0

### Tables E46. Teacher-reported professional development over the past 5 years (high school teachers)

Teacher Survey Q22. How would you rate the amount of professional development you completed in the following areas over the past 5 years? (Consider professional development you completed on your own as well as professional development offered by your district.)

·					Distric	et Type	
		O	verall	Allianc	e districts	Non-Allia	nce districts
	_	Valid	Valid	Valid	Valid	Valid	Valid
		Count	Percent	Count	Percent	Count	Percent
Learning management system	Much less than I needed	156	18.2	60	22.5	96	16.2
	Somewhat less than I needed	187	21.8	65	24.3	122	20.6
	About the amount I needed	399	46.4	107	40.1	292	49.3
	Somewhat more than I needed	72	8.4	20	7.5	52	8.8
	Much more than I needed	45	5.2	15	5.6	30	5.1
	Total N	859	100.0	267	100.0	592	100.0
Online instructional materials	Much less than I needed	209	24.3	72	26.8	137	23.2
for your curriculum content	Somewhat less than I needed	257	29.9	79	29.4	178	30.1
	About the amount I needed	316	36.7	89	33.1	227	38.4
	Somewhat more than I needed	55	6.4	21	7.8	34	5.8
	Much more than I needed	23	2.7	8	3.0	15	2.5
	Total N	860	100.0	269	100.0	591	100.0
Supporting social-emotional	Much less than I needed	247	28.7	79	29.4	168	28.3
learning during remote/hybrid	Somewhat less than I needed	242	28.1	75	27.9	167	28.2
instruction	About the amount I needed	232	26.9	75	27.9	157	26.5
	Somewhat more than I needed	81	9.4	21	7.8	60	10.1
	Much more than I needed	60	7.0	19	7.1	41	6.9
	Total N	862	100.0	269	100.0	593	100.0
Other strategies and skills for	Much less than I needed	203	33.7	65	33.5	138	33.8
remote/hybrid instruction	Somewhat less than I needed	122	20.3	42	21.6	80	19.6
(please describe):	About the amount I needed	232	38.5	75	38.7	157	38.5
	Somewhat more than I needed	29	4.8	5	2.6	24	5.9
	Much more than I needed	16	2.7	7	3.6	9	2.2
	Total N	602	100.0	194	100.0	408	100.0

### Tables E47. Teacher-reported professional development over the past 5 years (mixed-level teachers)

Teacher Survey Q22. How would you rate the amount of professional development you completed in the following areas over the past 5 years? (Consider professional development you completed on your own as well as professional development offered by your district.)

· · · ·		District Type							
	_	O	verall	Allianc	e districts	Non-Allia	nce districts		
	_	Valid	Valid	Valid	Valid	Valid	Valid		
		Count	Percent	Count	Percent	Count	Percent		
Learning management system	Much less than I needed	61	18.3	25	22.5	36	16.2		
	Somewhat less than I needed	75	22.5	26	23.4	49	22.1		
	About the amount I needed	154	46.2	44	39.6	110	49.5		
	Somewhat more than I needed	24	7.2	7	6.3	17	7.7		
	Much more than I needed	19	5.7	9	8.1	10	4.5		
	Total N	333	100.0	111	100.0	222	100.0		
Online instructional materials	Much less than I needed	85	25.5	27	24.3	58	26.1		
for your curriculum content	Somewhat less than I needed	89	26.7	27	24.3	62	27.9		
	About the amount I needed	114	34.2	41	36.9	73	32.9		
	Somewhat more than I needed	26	7.8	8	7.2	18	8.1		
	Much more than I needed	19	5.7	8	7.2	11	5.0		
	Total N	333	100.0	111	100.0	222	100.0		
Supporting social-emotional	Much less than I needed	98	29.3	28	25.2	70	31.4		
learning during remote/hybrid	Somewhat less than I needed	88	26.3	25	22.5	63	28.3		
instruction	About the amount I needed	104	31.1	38	34.2	66	29.6		
	Somewhat more than I needed	28	8.4	12	10.8	16	7.2		
	Much more than I needed	16	4.8	8	7.2	8	3.6		
	Total N	334	100.0	111	100.0	223	100.0		
Other strategies and skills for	Much less than I needed	65	28.0	21	27.3	44	28.4		
remote/hybrid instruction	Somewhat less than I needed	50	21.6	11	14.3	39	25.2		
(please describe):	About the amount I needed	96	41.4	39	50.6	57	36.8		
	Somewhat more than I needed	7	3.0	2	2.6	5	3.2		
	Much more than I needed	14	6.0	4	5.2	10	6.5		
	Total N	232	100.0	77	100.0	155	100.0		

Over 500 teachers selected the "other strategies and skills for remote/hybrid instruction" option and used the open-text field to describe other professional development they completed in the past five years; as shown above, the majority of these teachers described areas in which they needed more professional development. Many teachers reported that their district had not provided adequate training or support on how to adapt to remote/hybrid learning; when remote learning began in the spring of 2020; they lacked

the technology, technology skills, remote teaching skills, and engagement strategies needed to implement virtual instruction. Some teachers said that their districts provided technology for remote instruction (for example, learning management systems, apps and websites, cameras and other hardware, etc.) but did not provide adequate training on how to use these resources. Many teachers reported that they needed professional development related to learning management systems, specific apps and websites, video and document cameras, and general technology troubleshooting. And many teachers reported that they needed professional development that focused on technology integration—learning how to structure instruction and use technology to make remote learning effective. For example, teachers said they needed support in learning how to open and close breakout rooms in Zoom or Google Meet, but even more said they needed to learn how to use breakout rooms to facilitate small group instruction, peer learning, and student engagement. Teachers reported that with so many learning apps available, they needed support in deciding which apps to use for what purposes— live instruction, pre-recorded instruction, guided practice, formative assessment, summative assessment, etc.—not simply tutorials in how specific apps work. Overall, teachers acknowledged that when translating their lesson plans and instructional materials to a remote format, they needed to learn how to use technology to make instruction engaging and effective. In some cases, teachers wanted support with novel ways of interacting with students, especially disengaged students, while in other cases, teachers wanted support with finding or creating new digital content, such as remote science experiments, art projects, and field trips.

Classroom management was also a commonly mentioned area where professional development was needed, for example managing student behavior virtually, monitoring student devices, and controlling cheating, especially when using new strategies and platforms for student assessment. For teachers who were tasked with dual instruction, in which they taught both in-person and remote students at the same time, strategies were needed for keeping both groups engaged simultaneously. Some teachers said they needed professional development that focused on their setting (for example, self-contained special education classrooms), specific student groups (for example, English learners or students with IEPs), or their content area (for example, science or music). For example, teachers said they need training on how to implement individualized education programs (IEPs) for special education students in a virtual format, as well as how to teach English learners and use interpretation services during remote lessons to ensure equitable instruction. Many teachers reported that they needed support with family engagement—communicating with families about expectations for remote/hybrid learning, ways that the family could support student learning, and student progress, including concerns about attendance, engagement, and performance. Some teachers also reported that they needed professional development focused on work-life balance and personal well-being.

Importantly, many teachers reported that their districts allotted inadequate time to professional development. Some said that the professional development they completed was entirely self-taught and on their own time. Many teachers reported that the most valuable form of professional development they completed was collaboration with other staff members, either informal, with teachers taking the initiative to support and train each other, or formal, with schools training led by teachers or specialists. Some teachers

reported that they took the initiative to participate in online courses and certifications to improve their digital literacy. While many teachers said their districts did not meet their professional development needs, other teachers reported that their districts provided personalized learning platforms, support systems, and resource lists for professional development and training related to apps, technology tools, and blended learning.

#### Table E48. Teacher-reported professional development to support remote and hybrid learning

Teacher survey Q36. Is there anything else you'd like to share about your experiences as a Connecticut teacher during the COVID-19 pandemic?

Through the open-ended teacher survey question, some teachers reported that the professional development they received to prepare for remote and hybrid learning was adequate and effective. One teacher reported that when the pandemic began, teachers were given time to adapt to and deal with the situation both professionally and emotionally before beginning remote instruction. Multiple teachers reported that 2-4 days of professional development training was enough to complete extensive training on new technologies and teaching strategies. Some teachers reported that they received training on teaching during a pandemic and how to use online platforms. A number of teachers mentioned that they grew in their ability to effectively use technology to teach, with one teacher specifically mentioning using technology effectively for teaching English learners remotely. Multiple teachers reported that they hope to continue receiving professional development on digital literacy and different learning models to stay knowledgeable and be prepared to integrate remote learning into their teaching practices in the future, if needed.

At the same time, responses to the open-ended teacher survey question indicated that other teachers had many professional development needs that were not met by their districts. Respondents emphasized that there wasn't enough time dedicated to preparing teachers for remote instruction, and that they were thrown into remote, hybrid, and/or concurrent learning models without adequate training. Many teachers reported that they were given new apps, devices, and learning management without any training on how to implement these technologies. Some teachers who received professional development from their district shared the training was too broad and didn't meet their individual needs, especially for specific disciplines and for special education teachers. Some teachers said they sought professional development from sources outside their district or learned the new technologies by collaborating with other teachers. Teachers also reported that they received no health and safety training for in-person teaching, nor did their students. Teachers reported that they received no health and safety training post-pandemic or post-remote student populations. A multitude of teachers posited that students returning to in-person instruction were behind socially-emotionally, as well as academically, and teachers needed more professional development and training related to mental health and trauma.

### Research Question 3d. What tools and strategies introduced during the pandemic do administrators and teachers say they will continue to use in their practice?

### Table E49. District-reported remote/hybrid practices to continue after the pandemic has passed

District Inventory: Q26\_1 - Q26\_13. Do you plan to use any of the following online practices after the pandemic has passed? Please select all that apply.

	District Type							
	Ov	erall	Alliance	e districts	Non-Allia	nce districts	AP	SEPs
_	Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid
	Count	Percent	Count	Percent	Count	Percent	Count	Percent
Remote instruction for all students during isolated events (e.g., inclement weather days)	63	28.9	11	34.4	40	29.0	12	25.0
Remote instruction for any students whose families request it	15	6.9	5	15.6	2	1.4	8	16.7
Remote instruction for students with special circumstances (e.g., student illness)	99	45.4	16	50.0	61	44.2	22	45.8
One or more stand-alone online courses (e.g., credit recovery, certain advanced coursework)	112	51.4	26	81.3	74	53.6	12	25.0
Learning Management System and/or digital learning tools or platforms	145	66.5	24	75.0	102	73.9	19	39.6
Blended learning courses that include a combination of (but not concurrent) in-person instruction and online instruction	59	27.1	14	43.8	38	27.5	7	14.6
Blended learning courses where teachers instruct some students in person and some students online concurrently (e.g., simulcasting)	25	11.5	5	15.6	15	10.9	5	10.4
Virtual teacher trainings or professional development	178	81.7	27	84.4	114	82.6	37	77.1
Virtual meetings with students (e.g., counselors, social workers, or therapists meeting with students to provide services)	139	63.8	25	78.1	91	65.9	23	47.9
Virtual meetings with parents (e.g., parent-teacher conferences, events for parents)	204	93.6	30	93.8	130	94.2	44	91.7
Online diagnostic or benchmark assessments	136	62.4	25	78.1	99	71.7	12	25.0
Other online practice (please describe):	36	16.5	6	18.8	24	17.4	6	12.5
Additional comments:	24	11.0	3	9.4	17	12.3	4	8.3
Total N	218	100.0	32	100.0	138	100.0	48	100.0

Some districts elected to discuss additional online practices (beyond the multiple-choice options provided) that they plan to continue after the pandemic has passed. A common theme was the desire to continue online practices in certain circumstances to minimize learning loss, but that CT state policy has limited the options available for remote instruction, and thus it is not currently possible for districts to use remote learning days for isolated events. As a result, the majority of the other online practices mentioned are unrelated to instructional purposes. Some districts discussed that they would like to continue holding staff meetings and community meetings (such as board meetings) virtually, though the level of enthusiasm with this suggestion was mixed. Some districts wanted virtual staff/community meetings to be the default. Whereas, other districts said that they would continue virtual meetings only if other options were not available. Another use of online practices mentioned was providing academic resources to students virtually. For example, districts indicated that virtual practices could be used to share college opportunities with students, or to get access to more guest speakers that can't physically attend the class. Furthermore, virtual tutoring, skill development, and academic reinforcement were mentioned as potential virtual practices. Regardless of these online options, the most referenced concern about continuing online practices was that districts feel limited by state policy in what remote options they are allowed to provide for their students and their community.

Some districts provided additional comments regarding online practices they plan to continue after the pandemic has passed. There were again a multitude of districts that reported that they would like to have the option of doing remote instructional days during isolated events, but that they are currently limited by state policy; these limitations placed on remote instruction by CT state policy was a common theme throughout these comments. There were a couple of districts that reported that they are considering blended learning options to provide increased flexibility for their students in certain circumstances, such as to allow high school students to take on job opportunities. Another common comment was the use of online practices to increase engagement in the community. There were multiple districts that reported that they're planning to offer their events and programming both in-person and virtually to ensure that these events are accessible to all parents. In general, a plan to continue holding virtual meetings with parents was discussed by a few districts, in addition to holding virtual staff and community meetings. The goal expressed by many districts was to continue using online practices to increase accessibility and ease of involvement for parents and staff within their district.

### Table E50. Teacher-reported instructional technologies introduced during the pandemic by grade level

Teacher Survey Q20. Since the pandemic started, which new online instructional materials or technologies have you used that you had not used before the pandemic? Please select all that apply.

		District Type					
						Non-A	Alliance
		Ov	erall	Allianc	e districts	dis	tricts
		Valid	Valid	Valid	Valid	Valid	Valid
		Count	Percent	Count	Percent	Count	Percent
Elementary school	Learning management system	485	77.7	211	79.3	274	76.5
	Online instructional materials for your curriculum content	497	79.6	210	78.9	287	80.2
	Online instructional materials for SEL	383	61.4	171	64.3	212	59.2
	Other	125	20.0	56	21.1	69	19.3
	Total N	624	100.0	266	100.0	358	100.0
Middle school	Learning management system	160	45.7	67	58.8	93	39.4
	Online instructional materials for your curriculum content	244	69.7	78	68.4	166	70.3
	Online instructional materials for SEL	174	49.7	67	58.8	107	45.3
	Other	92	26.3	27	23.7	65	27.5
	Total N	350	100.0	114	100.0	236	100.0
High school	Learning management system	246	45.6	81	50.0	165	43.8
	Online instructional materials for your curriculum content	346	64.2	92	56.8	254	67.4
	Online instructional materials for SEL	241	44.7	81	50.0	160	42.4
	Other	145	26.9	41	25.3	104	27.6
	Total N	539	100.0	162	100.0	377	100.0
Multiple levels,	Learning management system	124	63.3	40	63.5	84	63.2
ungraded, or	Online instructional materials for your curriculum content	147	75.0	49	77.8	98	73.7
unknown	Online instructional materials for SEL	108	55.1	35	55.6	73	54.9
	Other	39	19.9	12	19.0	27	20.3
	Total N	196	100.0	63	100.0	133	100.0

		District Type						
		Ov	erall	Alliance	e districts	Non-Allia	nce districts	
		Valid Count	Valid Percent	Valid Count	Valid Percent	Valid Count	Valid Percent	
Learning management system	Would like to stop using	174	36.6	75	36.6	99	36.7	
	Would like to continue using	301	63.4	130	63.4	171	63.3	
	Total N	475	100.0	205	100.0	270	100.0	
Online instructional materials	Would like to stop using	98	20.0	40	19.4	58	20.4	
for your curriculum content	Would like to continue using	392	80.0	166	80.6	226	79.6	
	Total N	490	100.0	206	100.0	284	100.0	
Online instructional materials	Would like to stop using	108	28.6	52	30.8	56	26.8	
for SEL	Would like to continue using	270	71.4	117	69.2	153	73.2	
	Total N	378	100.0	169	100.0	209	100.0	
Other	Would like to stop using	18	14.9	6	11.3	12	17.6	
	Would like to continue using	103	85.1	47	88.7	56	82.4	
	Total N	121	100.0	53	100.0	68	100.0	

#### Table E51. Teacher-reported plans for instructional technology introduced during the pandemic (elementary teachers)

Teacher Survey Q21. Of the new online instructional materials or technologies you have been using since the pandemic started, which would you like to continue using and which would you like to stop using after the pandemic? (Elementary school teachers)

### Table E452. Teacher-reported plans for instructional technology introduced during the pandemic (middle school teachers)

Teacher Survey Q21. Of the new online instructional materials or technologies you have been using since the pandemic started, which would you like to continue using and which would you like to stop using after the pandemic? (Middle school teachers)

		District Type						
		Ov	erall	Alliance	e districts	Non-Alliance districts		
		Valid Count	Valid Percent	Valid Count	Valid Percent	Valid Count	Valid Percent	
Learning management system	Would like to stop using	22	14.1	11	16.9	11	12.1	
	Would like to continue using	134	85.9	54	83.1	80	87.9	
	Total N	156	100.0	65	100.0	91	100.0	
Online instructional materials	Would like to stop using	38	15.8	12	15.6	26	16.0	
for your curriculum content	Would like to continue using	202	84.2	65	84.4	137	84.0	
	Total N	240	100.0	77	100.0	163	100.0	
Online instructional materials	Would like to stop using	55	32.7	20	30.3	35	34.3	
for SEL	Would like to continue using	113	67.3	46	69.7	67	65.7	
	Total N	168	100.0	66	100.0	102	100.0	
Other	Would like to stop using	20	22.5	3	11.5	17	27.0	
	Would like to continue using	69	77.5	23	88.5	46	73.0	
	Total N	89	100.0	26	100.0	63	100.0	

		District Type						
		Ov	verall	Allianc	Alliance districts		nce districts	
		Valid Count	Valid Percent	Valid Count	Valid Percent	Valid Count	Valid Percent	
Learning management system	Would like to stop using	43	18.1	13	16.9	30	18.6	
	Would like to continue using	195	81.9	64	83.1	131	81.4	
	Total N	238	100.0	77	100.0	161	100.0	
Online instructional materials	Would like to stop using	46	13.5	11	12.2	35	13.9	
for your curriculum content	Would like to continue using	295	86.5	79	87.8	216	86.1	
	Total N	341	100.0	90	100.0	251	100.0	
Online instructional materials	Would like to stop using	85	36.0	23	29.5	62	39.2	
for SEL	Would like to continue using	151	64.0	55	70.5	96	60.8	
	Total N	236	100.0	78	100.0	158	100.0	
Other	Would like to stop using	37	26.1	12	31.6	25	24.0	
	Would like to continue using	105	73.9	26	68.4	79	76.0	
	Total N	142	100.0	38	100.0	104	100.0	

### Table E53. Teacher-reported plans for instructional technology introduced during the pandemic (high school teachers)

Teacher Survey Q21. Of the new online instructional materials or technologies you have been using since the pandemic started, which would you like to continue using and which would you like to stop using after the pandemic? (High school teachers)

### Table E54. Teacher-reported plans for instructional technology introduced during the pandemic (mixed level teachers) Table E54. Teacher-reported plans for instructional technology introduced during the pandemic (mixed level teachers)

Teacher Survey Q21. Of the new online instructional materials or technologies you have been using since the pandemic started, which would you like to continue using and which would you like to stop using after the pandemic? (Teachers who selected multiple grade levels, no grade levels, or "ungraded")

		District Type						
		Ov	erall	Allianc	e districts	Non-Allia	nce districts	
		Valid Count	Valid Percent	Valid Count	Valid Percent	Valid Count	Valid Percent	
Learning management system	Would like to stop using	20	17.4	7	18.4	13	16.9	
	Would like to continue using	95	82.6	31	81.6	64	83.1	
	Total N	115	100.0	38	100.0	77	100.0	
Online instructional materials	Would like to stop using	18	12.6	9	18.4	9	9.6	
for your curriculum content	Would like to continue using	125	87.4	40	81.6	85	90.4	
	Total N	143	100.0	49	100.0	94	100.0	
Online instructional materials	Would like to stop using	31	29.8	8	23.5	23	32.9	
for SEL	Would like to continue using	73	70.2	26	76.5	47	67.1	
	Total N	104	100.0	34	100.0	70	100.0	
Other	Would like to stop using	4	10.5	0	.0	4	15.4	
	Would like to continue using	34	89.5	12	100.0	22	84.6	
	Total N	38	100.0	12	100.0	26	100.0	

### Research Question 3e. What lessons do administrators and teachers say they learned regarding teaching and learning during the pandemic and how the state could improve in a future pivot to remote learning?

#### Table E55. Teacher-reported rankings by grade level of preferred learning model post-pandemic

Teacher Survey Q29. After the pandemic, please rank the following instructional models in terms of how you would you prefer to teach, if you had a choice?

		District Type								
			Overall		А	lliance distric	ts	Nor	-Alliance dist	ricts
			Mean			Mean		Mean		
		Ν	Ranking	(SD)	N	Ranking	(SD)	Ν	Ranking	(SD)
Elementary	Fully in-person instruction	610	1.1	(.5)	246	1.2	(.5)	364	1.1	(.5)
school	Hybrid model where I provide in-person and remote instruction concurrently	610	3.8	(1.2)	246	3.7	(1.2)	364	3.9	(1.2)
	Hybrid model where I provide in-person instruction and remote instruction not concurrently	610	2.7	(.9)	246	2.8	(1.0)	364	2.7	(.9)
	Fully remote instruction, where my students receive at least one synchronous/real-time class each school day	610	3.2	(1.0)	246	3.2	(1.0)	364	3.1	(.9)
	Fully remote instruction, where my students receive less than one synchronous/real-time class each school day	610	4.2	(1.0)	246	4.2	(1.0)	364	4.2	(.9)
Middle	Fully in-person instruction	361	1.1	(.5)	111	1.2	(.7)	250	1.1	(.5)
school	Hybrid model where I provide in-person and remote instruction concurrently	361	3.6	(1.3)	111	3.5	(1.3)	250	3.7	(1.3)
	Hybrid model where I provide in-person instruction and remote instruction not concurrently	361	2.8	(1.0)	111	2.7	(.9)	250	2.9	(1.0)
	Fully remote instruction, where my students receive at least one synchronous/real-time class each school day	361	3.3	(1.0)	111	3.4	(.9)	250	3.2	(1.0)
	Fully remote instruction, where my students receive less than one synchronous/real-time class each school day	361	4.2	(1.0)	111	4.2	(1.1)	250	4.1	(1.0)
High	Fully in-person instruction	540	1.2	(.7)	183	1.3	(.8)	357	1.1	(.6)
school	Hybrid model where I provide in-person and remote instruction concurrently	540	3.5	(1.2)	183	3.7	(1.3)	357	3.5	(1.2)
	Hybrid model where I provide in-person instruction and remote instruction not concurrently	540	3.0	(1.0)	183	2.9	(1.1)	357	3.0	(1.0)
	Fully remote instruction, where my students receive at least one synchronous/real-time class each school day	540	3.2	(1.0)	183	3.1	(1.0)	357	3.2	(1.0)
	Fully remote instruction, where my students receive less than one synchronous/real-time class each school day	540	4.1	(1.1)	183	4.0	(1.1)	357	4.2	(1.1)
Multiple	Fully in-person instruction	217	1.1	(.5)	67	1.1	(.4)	150	1.1	(.5)
levels,	Hybrid model where I provide in-person and remote instruction concurrently	217	3.5	(1.2)	67	3.5	(1.2)	150	3.6	(1.2)
ungraded, or	Hybrid model where I provide in-person instruction and remote instruction not concurrently	217	2.9	(1.0)	67	2.7	(.8)	150	2.9	(1.0)
unknown	Fully remote instruction, where my students receive at least one synchronous/real-time class each school day	217	3.3	(1.0)	67	3.3	(1.0)	150	3.3	(1.0)
	Fully remote instruction, where my students receive less than one synchronous/real-time class each school day	217	4.2	(1.0)	67	4.4	(.9)	150	4.1	(1.0)

Please note, teachers were asked to rank order the options listed above, with the highest ranked option receiving a score of 1 and the lowest ranked option receiving a score of 5.

### Table E56. Teacher-reported rankings by grade level of how prepared they feel to teach each of the learning models

Teacher Survey Q30. Considering the current point in time, please rank the following instructional models in terms of how prepared you feel to use them as a teacher.

		District Type								
			Overall		A	Alliance distric	ts	Nor	n-Alliance dist	tricts
			Mean			Mean			Mean	
		Ν	Ranking	(SD)	N	Ranking	(SD)	Ν	Ranking	(SD)
Elementary	Fully in-person instruction	610	1.0	(.2)	246	1.0	(.2)	364	1.0	(.2)
school	Hybrid model where I provide in-person and remote instruction concurrently	610	3.6	(1.3)	246	3.5	(1.3)	364	3.7	(1.3)
	Hybrid model where I provide in-person instruction and remote instruction not concurrently	610	3.0	(1.0)	246	3.0	(1.0)	364	3.0	(1.0)
	Fully remote instruction, where my students receive at least one synchronous/real-time class each school day	610	3.3	(.9)	246	3.3	(.9)	364	3.3	(.8)
	Fully remote instruction, where my students receive less than one synchronous/real-time class each school day	610	4.1	(1.0)	246	4.2	(1.0)	364	4.1	(1.0)
Middle	Fully in-person instruction	361	1.1	(.3)	111	1.0	(.2)	250	1.1	(.4)
school	Hybrid model where I provide in-person and remote instruction concurrently	361	3.4	(1.3)	111	3.4	(1.3)	250	3.5	(1.3)
	Hybrid model where I provide in-person instruction and remote instruction not concurrently	361	3.0	(1.0)	111	3.0	(1.0)	250	3.0	(1.0)
	Fully remote instruction, where my students receive at least one synchronous/real-time class each school day	361	3.3	(.9)	111	3.4	(.8)	250	3.3	(.9)
	Fully remote instruction, where my students receive less than one synchronous/real-time class each school day	361	4.2	(1.0)	111	4.2	(1.0)	250	4.2	(1.0)
High	Fully in-person instruction	540	1.1	(.3)	183	1.1	(.4)	357	1.0	(.3)
school	Hybrid model where I provide in-person and remote instruction concurrently	540	3.4	(1.3)	183	3.5	(1.3)	357	3.3	(1.2)
	Hybrid model where I provide in-person instruction and remote instruction not concurrently	540	3.2	(1.0)	183	3.2	(1.0)	357	3.2	(1.0)
	Fully remote instruction, where my students receive at least one synchronous/real-time class each school day	540	3.3	(.9)	183	3.1	(.9)	357	3.3	(.9)
	Fully remote instruction, where my students receive less than one synchronous/real-time class each school day	540	4.1	(1.1)	183	4.0	(1.1)	357	4.1	(1.0)
Multiple	Fully in-person instruction	217	1.0	(.3)	67	1.0	(.1)	150	1.1	(.4)
levels,	Hybrid model where I provide in-person and remote instruction concurrently	217	3.6	(1.3)	67	3.8	(1.3)	150	3.5	(1.3)
ungraded, or	Hybrid model where I provide in-person instruction and remote instruction not concurrently	217	3.0	(.9)	67	2.9	(.9)	150	3.1	(1.0)
unknown	Fully remote instruction, where my students receive at least one synchronous/real-time class each school day	217	3.2	(.9)	67	3.2	(.9)	150	3.3	(.9)
	Fully remote instruction, where my students receive less than one synchronous/real-time class each school day	217	4.1	(1.1)	67	4.1	(1.0)	150	4.1	(1.1)

Please note, teachers were asked to rank order the options listed above, with the highest ranked option receiving a score of 1 and the lowest ranked option receiving a score of 5.

### Table E57. Teacher-reported rankings by grade level of how effective the learning models are for students

Teacher Survey Q31. In your opinion, please rank the following instructional models in terms of how effective you believe they are for the average student.

		District Type								
			Overall		A	Alliance distric	ts	Nor	n-Alliance dist	tricts
			Mean			Mean			Mean	
		Ν	Ranking	(SD)	N	Ranking	(SD)	Ν	Ranking	(SD)
Elementary	Fully in-person instruction	610	1.0	(.2)	246	1.0	(.3)	364	1.0	(.2)
school	Hybrid model where I provide in-person and remote instruction concurrently	610	3.4	(1.2)	246	3.3	(1.2)	364	3.5	(1.2)
	Hybrid model where I provide in-person instruction and remote instruction not concurrently	610	2.6	(.8)	246	2.7	(.8)	364	2.6	(.8)
	Fully remote instruction, where my students receive at least one synchronous/real-time class each school day	610	3.4	(.8)	246	3.4	(.8)	364	3.4	(.8)
	Fully remote instruction, where my students receive less than one synchronous/real-time class each school day	610	4.5	(.7)	246	4.6	(.7)	364	4.5	(.7)
Middle	Fully in-person instruction	361	1.0	(.3)	111	1.1	(.4)	250	1.0	(.2)
school	Hybrid model where I provide in-person and remote instruction concurrently	361	3.3	(1.2)	111	3.1	(1.2)	250	3.3	(1.2)
	Hybrid model where I provide in-person instruction and remote instruction not concurrently	361	2.7	(.8)	111	2.6	(.8)	250	2.7	(.8)
	Fully remote instruction, where my students receive at least one synchronous/real-time class each school day	361	3.5	(.8)	111	3.5	(.7)	250	3.4	(.8)
	Fully remote instruction, where my students receive less than one synchronous/real-time class each school day	361	4.6	(.7)	111	4.6	(.8)	250	4.5	(.7)
High	Fully in-person instruction	540	1.1	(.4)	183	1.1	(.5)	357	1.0	(.3)
school	Hybrid model where I provide in-person and remote instruction concurrently	540	3.2	(1.2)	183	3.3	(1.2)	357	3.1	(1.1)
	Hybrid model where I provide in-person instruction and remote instruction not concurrently	540	2.9	(1.0)	183	2.9	(1.0)	357	2.9	(.9)
	Fully remote instruction, where my students receive at least one synchronous/real-time class each school day	540	3.4	(.9)	183	3.3	(.9)	357	3.5	(.8)
	Fully remote instruction, where my students receive less than one synchronous/real-time class each school day	540	4.4	(.9)	183	4.3	(.9)	357	4.5	(.8)
Multiple	Fully in-person instruction	217	1.0	(.3)	67	1.0	(.2)	150	1.0	(.3)
levels,	Hybrid model where I provide in-person and remote instruction concurrently	217	3.4	(1.2)	67	3.5	(1.3)	150	3.3	(1.2)
ungraded, or	Hybrid model where I provide in-person instruction and remote instruction not concurrently	217	2.8	(.9)	67	2.6	(.7)	150	2.9	(.9)
unknown	Fully remote instruction, where my students receive at least one synchronous/real-time class each school day	217	3.4	(.8)	67	3.4	(.7)	150	3.4	(.8)
	Fully remote instruction, where my students receive less than one synchronous/real-time class each school day	217	4.5	(.9)	67	4.6	(.7)	150	4.4	(.9)

Please note, teachers were asked to rank order the options listed above, with the highest ranked option receiving a score of 1 and the lowest ranked option receiving a score of 5.

### Table E58. Teacher-reported "lessons learned" about teaching and learning during a crisis

*Teacher survey Q36. Is there anything else you'd like to share about your experiences as a Connecticut teacher during the COVID-19 pandemic?* 

### State-Level Policies

Many teacher survey respondents used the open-ended question at the end of the survey to share "lessons learned" about teaching and learning during the pandemic. Respondents described the accumulating effects of multiple years of disruptions to learning—the unplanned shift to remote learning in spring 2020, the constant and rapid changes among learning models in 2020-21, and the pressure to return to "business as usual" in 2021-22. Respondents noted the wide variation in how districts implemented remote learning at the start of the pandemic and the return to in-person school in 2020-21, with some districts returning to full-time in-person learning at the start of fall 2020 and other districts returning to in-person learning later in the school year and sometimes in a hybrid format. Teacher respondents described the enormous gaps in academic and social-emotional development that resulted from the disruptions over the first 16 months of the pandemic, with some teachers pointing out that students continued to miss large chunks of instruction in 2021-22 as the result of absences related to illness or quarantine.

### Accountability/Standardized Testing

Many teacher survey respondents expressed frustration with the idea that teachers could return to normal instruction during 2021-22 as students and teachers coped with learning loss and ongoing COVID-related disruptions. Some teachers said that while their districts were understanding and flexible with teachers and students at the start of the pandemic, school and district leadership became much less supportive as time went on. Teachers reported that in the 2020-21 and 2021-22 school years, districts prioritized curriculum coverage and standardized assessment scores over mental health for students and staff. One teacher said, "We jumped *back to normal* too quickly." Many teachers mentioned that leaders' expectations of teachers and students were unreasonable, with several proposing that curriculum and assessment expectations needed to be adjusted at the local, state, and/or national level to address learning loss and accommodate social-emotional challenges. One teacher said "...students are developmentally & academically behind and all we are being told is *fix it* with no plan. This is a national issue that needs to be looked at; either add on years to our education system or revamp what needs to be taught in the Common Core curriculum. Teachers cannot just *fix it!*" Another voiced a common theme by saying, "Stop the state mandates for testing, let us teach our students and help them get back on grade level along with dealing with their social-emotional needs." Other teachers said that evaluating teachers during an ongoing crisis was unreasonable and added unnecessary stress, while others noted that teachers were evaluated unfairly for being unable to remediate learning loss or behavior challenges quickly enough. One teacher said, "teachers are leaving because it is impossible to do their jobs."

### Funding for Public Education

Teacher survey respondents who used the open-ended question at the end of the survey to reflect on funding for public education generally said that funding was inadequate. A number of respondents said that their districts had not given them the materials or tools they needed for remote, hybrid, or social-distanced in-person instruction; several teachers said they purchased equipment and supplies with their own money. Some teachers said that more funding was needed to increase staffing, for example, more teachers to reduce class sizes, additional paraprofessionals to support student learning, and more social workers to help students cope with the effects of the pandemic. Other teachers said their districts did not have adequate funding to address students' complex needs. One teacher said, "Students who were behind fell further behind, which was often not the fault of teachers or the school districts, but rather the fault of not having fully funded budgets to support staff, not having high quality materials, not having social supports in place for mental health, child care, and providing for basic needs like housing and food."

Other respondents reflected on the equity of funding for public education; most of these respondents agreed that inequitable funding of school districts was an issue throughout the pandemic. These teachers described substantial differences between affluent districts and less affluent districts, in terms of devices for 1:1 computing and other instructional technology, reliable internet access at students' homes and in school, and district preparedness for the shift to remote learning in March 2020. One teacher said, "The inequities between urban school students and students in well-funded districts have grown dramatically. I teach in a priority district and my children teach/live in [affluent towns]. It was sickening the difference in resources my grandchildren in [affluent town] received and the lack of resources my students in [city] had. My students had weak or non-existent internet/wi-fi which caused excessive absences and parents just giving up." Another teacher said, "the pandemic exposed gross and shameless educational inadequacies throughout the state of Connecticut. Poor and disenfranchised students in this wealthy state have very separate, and very unequal schools. The students have many more needs, and those needs should be met with adequate staffing and funding."

### **Respect for teachers**

Over 10% of those teachers who responded to the open-ended teacher survey question commented on respect for teachers. A large number of teachers expressed frustration that they had to work much harder during the pandemic without appreciation or increased compensation. Many of these responses related to lack of acknowledgement of teachers' hard work, dedication, and acceptance of personal risk during the pandemic. Many teacher survey respondents said they felt like no one cared about teachers' health or emotional wellbeing, with teachers commenting on inadequate safety protocols and unrealistic expectations for teaching and learning. One teacher said, "Teacher voice was not heard concerning physical distancing, class sizes," while another talked about the premature end of mask requirements, and a third said, "Just as other professionals were protected, so should we have been." From the perspective of spring 2022, many teacher survey respondents used the open-ended question to expressed dismay that teachers were overlooked for hazard pay, COVID sick time, or increased compensation, with a very large number saying that they were disappointed that legislation

had not passed to give teachers credit toward retirement for two extra years of service. Many respondents shared this sentiment expressed by one: "Find a way to compensate school employees and essential workers who did their best to keep schools open and students engaged in learning during the pandemic."

Many respondents reported feeling criticized by leaders and the general public for their work during the pandemic; for example, teachers said they were criticized for district decisions not to return to full-time in-person instruction in fall 2020 or blamed unfairly for student learning loss. One teacher said, "The public opinion of teachers in the pandemic swayed very quickly from heroes to zeroes as people became more frustrated with the pandemic." Another teacher said, "No one seems to recognize what we went through. People recognize what nurses and doctors went through. ... We did not feel taken care of or valued." A fourth teacher said, "the community, government, and district leaders have done a terrible job at taking care of their teachers. ... We were heroes and now we are the enemy expected to teach content and SEL. This is not what education is supposed to be."

Many respondents talked about the lack of respect for teachers that was demonstrated by failure to engage teachers' expertise and feedback throughout the pandemic. One teacher said, "Our school boards and government officials need to start listening to teachers, who are highly educated professionals, about what the needs are in the classrooms." Another wrote, "Teaching is always hard, but it got harder, and we don't expect next year [2022-23] to be any easier. At the end of the day, we would take a bullet to protect our students, despite any disrespect from families or our districts. Teachers are not trusted to be experts in their fields despite multiple master's degrees and certifications." Teachers expressed frustration about leadership structures and inflexible policies that prevented them from teaching in ways they believe would best serve students. For example, one teacher said, "I feel as if we lost an opportunity during the pandemic to reevaluate and redesign how we teach to meet the needs of more students. Instead, our concerns and suggestions as the teachers in the classroom were often ignored if not outright ridiculed."

Many teachers talked about the effects of disrespect on teacher morale and teacher attrition. "Teachers have come out of this embattled, embittered, and empty. We take pride in being educators but that is not what was happening during *the Covid years*. We were forced to be babysitters. The teachers and kids are not okay." Many respondents expressed concern about the large number of people leaving the profession and the small number people entering it. One respondent said, "I worry about future generations of people not entering the teaching field due to the complications, public opinions and political effects of the pandemic." Another said, "This country needs to rethink the treatment of the teaching profession. In order to sustain our public schools, there needs to be additional financial incentive to teach, better working conditions, and a shared community commitment to educating our youth." A third teacher said, "I actually lose sleep with concerns of where we are headed as an institution. I went into teaching because I felt our youth was the most valuable resource we had in this world and any effort to help them become their best had meaning. I do not feel that way especially after this year. ... the level of respect for teachers and the power of learning is non-existent."

### **Appendix F: Student outcomes (Research Goal 4)**

### Q4a. To what extent were students able to access remote learning?

### Detailed findings from administrative data analysis: Effects on Student Enrollment in 2020-21

In order to examine changes in fall enrollment, we first plotted total state enrollment year by year separately for public pre-school, kindergarten, 1<sup>st</sup>-5<sup>th</sup> grade, 6<sup>th</sup>-8<sup>th</sup> grade and 9<sup>th</sup>-12<sup>th</sup> grade initializing all enrollment by dividing by 2014 enrollment levels. In Figure 1, we show these trends for Alliance Opportunity districts, the 10 districts in the state that are lowest performing on standardized tests. While 1<sup>st</sup>-5<sup>th</sup> grade fall enrollment fell between 2019-20 and 2020-21, the decline in enrollment was very similar in magnitude to declines in the preceding years, and there is no evidence of a decline due to the pandemic. However, for public pre-school and for kindergarten, enrollments drop dramatically between fall 2019-20 and 2020-21, declines much larger than the declines in previous years. In general, across all district types, we observe minimal deviation from trends in pandemic enrollment patterns, except in kindergarten and pre-school where we observe substantial declines. Figure 2 presents similar results for all non-Alliance districts and LEA's. Comparing Figures 1 and 2 shows that Alliance Opportunity districts experienced larger declines in kindergarten enrollment.



Figure F1. Enrollment Patterns for Alliance Opportunity Districts

The number of 2014 students that are PK is 3400. The number of 2014 students that are K is 8900.

The figure presents the average of enrollment in district and year as a fraction of district's 2014 enrollment. PK stands for public pre-school and K stands for kindergarten. All numbers on the legend refer to grades. Alliance Opportunity districts are the 10 lowest scoring public school districts in the state.



Figure F2. Enrollment Patterns for Non-Alliance Districts

The number of 2014 students that are PK is 8670. The number of 2014 students that are K is 19394.

The figure presents the average of enrollment in district and year as a fraction of district's 2014 enrollment. PK stands for public pre-school and K stands for kindergarten. All numbers on the legend refer to grades. Non-Alliance districts represent all LEAs except for the 36 lowest test scoring public school districts.

Next, we more closely examine kindergarten enrollment, which is relatively universal within the state, while we do not examine public pre-school, which represents a much more selected population. For kindergarten, we do not observe the full population of students eligible to enroll in kindergarten, and instead we use whether the school provided an in=person option in September as a dependent variable in a student sample to capture changes in enrollment patterns. Table F1 shows these results for kindergarten, as well as 1<sup>st</sup> and 2<sup>nd</sup> grade for comparability. Panel one presents results for the pandemic effect on the composition of students between schools that provided an in-person option in September of 2020 and those that did not. Estimates suggest a small decline of approximately ½ of one percentage point in kindergarten enrollment loss, significant at the 10% level, with no significant effects for 1<sup>st</sup> or 2<sup>nd</sup> grade. This effect is quite small given the 10 percentage point or more declines in October 2020 kindergarten enrollment. Further, the noisily estimated effect on the interaction of the pandemic variable with share high needs students is negative. Therefore, at the 75<sup>th</sup> percentile share of high needs students, our best estimate is that there is no improvement in October enrollment, even though kindergarten enrollment losses were stronger for more disadvantaged schools.

As a second approach, we use the sample of students enrolled in first grade in the fall of 2021-22 as a baseline and examine whether those students are observed as enrolled in kindergarten in the previous year. We estimate this model for September enrollment in kindergarten based on share of days offered in person in September, October to December enrollment (observed enrolled in any of the three months) based on share of days during the same period, and same for both January to March and April to June. These results are shown in Table F2. The first row presents the estimate on share of days in person and the second row presents the estimated constant, which captures the fraction or share of first grade students observed as enrolled at the state average share of days interacted with the pandemic dummy. Results are similar across both panels. In person offerings do not appear to have any effect on kindergarten enrollment either initially or throughout the year. Looking at the intercept, we observe that approximately 87% of first graders in the following year were not enrolled in kindergarten in September. The share enrolled by the end of the year climbs to 91% when measured at the average share of days offered in person.

Next, Table F3 presents estimates of our difference-in-differences model of continued enrollment separately by column for 1<sup>st</sup> through 5<sup>th</sup>, 6<sup>th</sup> through 8<sup>th</sup>, and 9<sup>th</sup> and 12<sup>th</sup> grades. The top panel presents the unweighted results and the second panel presents results using the overlap propensity score weights based on the estimates presented in Table 1. The interaction term estimates in the top panel suggest that the in person option minimizes pandemic year enrollment loss by over a percentage point in elementary and by about two-thirds of a percentage point for middle school, but these effects are eroded substantially (especially in elementary school) by the use of overlap weights. These findings suggest that the effect of providing an in person option on enrollment in panel 1 was spurious and likely driven by differences between schools that offered a September in person option and those that did not. Table F4 presents continued enrollment estimates after including interactions with share of high need students. Most estimates are

insignificant, and we do not observe any systematic relationship between an in-person option and continued enrollment.

	(2)	(3)	(4)
Controls	Kindergarten	Grade 1	Grade 2
Pandemic year	0.00499*	-0.00106	0.000661
	(0.00262)	(0.00217)	(0.00238)
Observations	251,767	258,433	261,228
R-squared	0.000	0.000	0.000
Pandemic year	0.00990*	0.00248	0.00266
	(0.00558)	(0.00485)	(0.00499)
Pandemic year*Share of high need students	-0.0150	-0.00971	-0.00450
	(0.0123)	(0.00967)	(0.00980)
Observations	250,146	256,762	259,238
R-squared	0.038	0.059	0.065
2019-20 Mean School Enrollment w/ In Person Option	77.8	76.0	76.8
2020-21 Mean School Enrollment w/ In Person Option	69.6	75.2	74.9
2019-20 Mean School Enrollment w/out In Person Option	65.4	65.4	66.3
2020-21 Mean School Enrollment w/out In Person Option	55.9	64.5	64.6
25th Percentile High Needs			
Pandemic Effects on Relative Enrollment In-Person			
Option	0.00578**	-0.0002	0.0014
75th Percentile High Needs			
Pandemic Effects on Relative Enrollment In-Person			
Option	0.00004	-0.0046	-0.0007

#### Table F1. In-Person Option in September as Dependent Variable

Note: The top panel shows the results of regressing in person/hybrid learning mode offered in September on a pandemic dummy variable and a linear trend. The columns present estimates for kindergarten, 1st and 2nd grades. The second panel presents results based on adding controls for the school share of students who are high needs, and the interaction of this variable with the pandemic dummy. The bottom panel presents mean enrollment in districts with and without a pandemic in person option both for periods prior to and during the pandemic. The final two rows in the bottom panel present the estimated effect of the pandemic based on the estimates in panel 2 measured at the 25th and 75th percentiles of share high need students.

	(1)	(2)	(3)	(4)						
Observed Enrollment	September	Oct-Dec	Jan-Mar	Apr-Jun						
	•			•						
No Propensity Score										
Share of Days in Person	0.00793	0.0234	0.0242	0.0260						
-	(0.0229)	(0.0169)	(0.0169)	(0.0198)						
Share Present at the Mean	0.869***	0.897***	0.909***	0.911***						
	(0.0125)	(0.0124)	(0.0132)	(0.0161)						
	× ,		. ,	. ,						
Observations	33,797	33,797	33,797	33,797						
R-squared	0.000	0.001	0.000	0.000						
	Conditional on C	Centered Propensity Sc	ore							
Share of Days in Person	0.00793	0.0234	0.0242	0.0260						
-	(0.0229)	(0.0169)	(0.0169)	(0.0198)						
Share Present at the Mean	0.874***	0.912***	0.925***	0.930***						
	(0.00528)	(0.00349)	(0.00326)	(0.00317)						
Observations	33,797	33,797	33,797	33,797						
R-squared	0.000	0.001	0.000	0.000						
Mean Non-Remote share for										
each time period	0.6267112	0.6433241	0.6774023	0.729346						

### Table F2: Enrolled in Kindergarten if Observed in First Grade Next Year

The table shows the results of whether a first-grade student in the next year is enrolled in kindergarten during the pandemic year on share of days in person. The columns present estimates for enrollment observed any time in September, October to December, January to March and April to the end of the school year and share of days in person are calculated for each column in the same month. The share of present at the mean row shows the intercept because the share of days in person variables are mean differenced. The top panel presents the OLS estimates, and the bottom panel presents estimates including a control for the propensity score that is centered with a mean zero.

	(1)	(2)	(2)							
	(1)	(2)	(3)							
	Grades 1st	Grades 6th	Grades 9th							
Controls	through 5th	through 8th	through 12th							
Unweighted Model										
Pandemic year	-0.00288	0.00139	0.00315*							
•	(0.00221)	(0.00128)	(0.00172)							
Pandemic vear*In person learning option in Sept	-0.0125***	-0.00691***	-2.66e-06							
	(0.00242)	(0.00150)	(0.00179)							
	(0.002.2)	(0.00100)	(0.00173)							
Observations	726,758	468,726	636.613							
R-squared	0.015	0.272	0.417							
		•								
Propensity Score Weights										
Pandemic year		0.00185	0 00307**							
i andenne year	(0.0030)	(0.00133)	(0.00397)							
Den lande en skie en la mine antien in Cant	(0.00231)	(0.00124)	(0.00133)							
Pandemic year in person learning option in Sept	-0.00249	-0.004/9***	0.00127							
	(0.00280)	(0.00225)	(0.00184)							
		460 506	(2)((1))							
Observations	/26,/58	468,726	636,613							
R-squared	0.016	0.271	0.264							
Fall Re-enrollment 2017-2019 w/ In-Person										
Option	0.978	0.978	0.969							
Fall Re-enrollment 2017-2019 Remote Only	0.978	0.983	0.972							
Fall Re-enrollment 2020-2021 w/ In-Person										
Option	0.963	0.973	0.973							
Fall Re-enrollment 2020-2021 Remote Only	0.975	0.983	0.977							

### Table F3. Fall Enrollment if Enrolled in the Previous Year

The top panel presents the estimates of regressing whether a student is observed enrolled in October of each year on a dummy variable for the pandemic year, the interaction of the pandemic dummy with a dummy variable for in person/hybrid option provided in September, and school fixed effects. Columns 1 through 3 present results for elementary, middle and high school grades, respectively. The second panel presents overlap propensity score weighted estimates based on the model presented in Table 1. The bottom panel presents student reenrollment rates year to year separately for schools with and without a pandemic in person/hybrid option both for the pre-pandemic period and during 2020-21.

	(1)	(2)	(3)							
	Grades 1st	Grades 6th	Grades 9th							
Controls	through 5th	through 8th	through 12th							
Unweighted Model										
Pandemic year*Share high need students	0.0201	-0.00260	0.0106*							
	(0.0191)	(0.0168)	(0.00549)							
Pandemic year*Share high need students*	0.0116	0.0134	-0.00254							
In Person learning option	(0.0196)	(0.0171)	(0.00625)							
Observations	726,758	468,726	636,613							
R-squared	0.015	0.272	0.417							
Propens	ity Score Weights									
Pandemic year*Share high need students	0.0150	0.00550	0.00960*							
	(0.0223)	(0.0184)	(0.00509)							
Pandemic year*Share high need students*	0.0222	0.0108	0.00413							
In Person learning option	(0.0228)	(0.0196)	(0.00682)							
Observations	726,758	468,726	636,613							
R-squared	0.016	0.271	0.264							
25th Percentile High Needs										
Pandemic Effects Remote	-0.0098	-0.0007	0.0006							
Pandemic Effects In-Person Option	-0.0205	-0.0102	0.0007							
75th Percentile High Needs										
Pandemic Effects Remote	-0.0028	0.0017	0.0041							
Pandemic Effects In-Person Option	-0.0030	-0.0029	0.0056							

### Table F4. Fall Enrollment and Share High Need Students

The top panel presents the estimates of regressing whether a student is observed enrolled in October of each year on a dummy variable for the pandemic year, the interaction of the pandemic dummy with a dummy variable for in person/hybrid option provided in September, the interaction of the pandemic dummy with school share of high needs students, the three way interaction between pandemic-in person/hybrid-share high needs, and school fixed effects. Columns 1 through 3 present results for elementary, middle and high school grades, respectively. The second panel presents overlap propensity score weighted estimates based on the model presented in Table 1. The bottom panel presents estimated effects of the pandemic on re-enrollment based on the estimates in panel 2, separately for in-person/hybrid and fully remote at the 25th and 75th percentiles of school share of high needs students.

#### Detailed findings from administrative data analysis: Effects on Attendance in 2020-21

Table F5 presents estimates of the effect of in person learning availability on attendance using similar models to enrollment except including a student level control for two year lagged past attendance rates. Models using samples with one-year lags with attendance through March in 2019-20 yield very similar results. The top panel presents the results without the interaction between propensity score and the pandemic variable, and the second panel presents the results after conditioning on this interaction. In both panels, we observe very large declines in attendance during the pandemic of between 2.5 to 4.5 percentage points with larger declines in earlier grades. Further, schools that provide a greater share of days in person experience less enrollment loss at all grade levels, especially in elementary and middle school. The inclusion of the propensity score leads to a reduction in the effect of in person share, and the high school estimates are substantially smaller and insignificant. However, pandemic effect estimates also erode in magnitude so that providing an in-person option ameliorates a similar share of the learning loss in elementary and middle school whether or not models include the propensity score. The bottom panel presents predicted attendance rates at the 10<sup>th</sup> and 90<sup>th</sup> percentiles of share of in person using the propensity score model: 46% vs. 100% in person for elementary, 44% vs. 94% for middle and 41% vs. 82% for high school. In elementary, a school at the 90<sup>th</sup> percentile of in person share is predicted to have a 2 percentage point lower decline in attendance during the pandemic relative to the 10<sup>th</sup> percentile. Improvements are 1 percentage point for middle school and only half a point for high school.

Table F6 presents the results allowing effects to differ between schools with a low versus high share of high need students. In both models with and without propensity score, we observe that attendance outcomes during the pandemic are substantially worse in schools that have a larger share of high need students across all grade levels. Comparing attendance rates for the 25<sup>th</sup> and 75<sup>th</sup> percentiles of share high needs, the bottom panel shows 2 to 3 percentage point worse attendance rates for schools at the 75<sup>th</sup> percentile. However, the positive significant estimate on the interaction between share days in person and share high needs in panel 1, which is consistent with the previous findings of Halloran et al. (2021) and Goldhaber et al. (2022) for test scores, is not robust to the inclusion of propensity score control (Panel 2). The estimate declines by 35 percent and is no longer significant. In the bottom panel for elementary school, we do observe a one percentage point difference based on remote versus in person learning at the 75<sup>th</sup> percentile that is not observed at the 25<sup>th</sup> percentile, and at the 75<sup>th</sup> percentile the estimate on the interaction between share in high needs is statistically significant,<sup>4</sup> but overall our propensity score models provide minimal evidence that in person learning has differential effects between schools based on the share of high needs students.

All models have been estimated grade by grade, and results for pooled elementary, middle and high school grades above are replicated at the individual grade level.

<sup>&</sup>lt;sup>4</sup> Specifically, the coefficient on this interaction is significant in a model where the share high needs variable takes the value of zero at the 75<sup>th</sup> percentile, negative below and positive above.

P =	(1)	(2)	(3)
	Grades 2nd	Grades 6th	Grades 9th
Controls	through 5th	through 8th	through 12th
No Prope	ensity Score		
Lagged Attendance	0.404 ***	0.655***	0.660***
	(0.0302)	(0.0125)	(0.0197)
Pandemic year	-0.0468***	-0.0371***	-0.0276***
	(0.00372)	(0.00606)	(0.00986)
Pandemic year*Share of days in person	0.0487***	0.0318***	0.0198
	(0.00447)	(0.00825)	(0.0166)
Observations	584.085	444.062	592.910
R-squared	0.208	0.244	0.291
Conditional on Cen Lagged Attendance	tered Propensity Sco 0.404***	ore 0.655***	0.659***
	(0.0301)	(0.033)	(0.05)
Pandemic year	-0.0382***	-0.0325***	-0.0256***
	(0.00349)	(0.00525)	(0.00250)
Pandemic year*Share of days in person	0.0354***	0 0223***	0.0125
randonno your sharo or days in person	(0,00422)	(0.00223)	(0.0129)
Pandemic year*Centered propensity score	0.0609***	0.0526***	0 342***
Tundenne yeur Centered propensky seore	(0.00854)	(0.0165)	(0.0607)
Observations	584 085	444 062	592 010
R_squared	0 215	0 248	0 297
it squared	0.213	0.270	0.277
Average Attendance Rates 2017-2018, 2018-2019,			
2019-20	0.956	0.953	0.938
Average Attendance Rates 2020-21	0.944	0.934	0.919
10th Percentile Share of In Person Days Available	0.456	0.441	0.414
90th Percentile Share of In Person Days Available	1.000	0.943	0.818
Pandemic Effects at 10th Percentile Share In Person	-0.022	-0.023	-0.020
Pandemic Effects at 90th Percentile Share In Person	-0.003	-0.011	-0.015

### Table F5. Attendance conditional on previous year attendance

The top panel presents the estimates of regressing student annual attendance rates on one year lagged student attendance rates, a dummy variable for the pandemic year, the interaction of the pandemic dummy with the share of days offered in person during the school year, and school fixed effects. Columns 1 through 3 present results for elementary, middle and high school grades, respectively. The second panel presents results of a model that also includes the propensity score from the estimates in Table 2 interacted with the pandemic dummy. The bottom panel presents average attendance rates pre-pandemic and during 2020-21. Share of days offered in person at the 10th and 90th percentiles, and estimates effects of the pandemic based on the estimates in panel 2 calculated at the 10th and 90th percentile share of days.
	(1)	(2)	(3)
	Grades 2nd	Grades 6th	Grades 9th
Controls	through 5th	through 8th	through 12th
No Pro	pensity Score		
Lagged Attendance	0.404***	0.655***	0.659***
	(0.0301)	(0.0124)	(0.0196)
Pandemic year*Share high need students	-0.0994***	-0.0732***	-0.0376
	(0.0127)	(0.0216)	(0.0402)
Pandemic year*Share high need students*	0.0340**	-0.0260	-0.0848
In Person learning option	(0.0162)	(0.0321)	(0.0655)
Observations	584,085	444,062	592,910
R-squared	0.225	0.261	0.297
Conditional on Co	entered Propensity Sc	ore	
Lagged Attendance	0.404***	0.655***	0.659***
	(0.0301)	(0.0124)	(0.0196)
Pandemic year*Share high need students	-0.0840***	-0.0808***	-0.00416
	(0.0131)	(0.0225)	(0.0369)
Pandemic year*Share high need students*	0.0224	-0.0203	-0.0868
In Person learning option	(0.0163)	(0.0306)	(0.0647)
Pandemic year*Centered propensity score	0.0170**	-0.00916	0.168***
	(0.00754)	(0.0194)	(0.0637)
Observations	584,085	444,062	592,910
R-squared	0.225	0.262	0.298
25th Percentile High Needs			
Pandemic Effects 10th Percentile In-Person	0.004	0.006	-0.011
Pandemic Effects 90th Percentile In-Person	0.0067	0.0057	-0.0011
In-Person Option Interaction Significance			
75th Percentile High Needs			
Pandemic Effects 10th Percentile In-Person	-0.0310	-0.0336	-0.0252
Pandemic Effects 90th Percentile In-Person	-0.0222	-0.0383	-0.0283
In-Person Option Interaction Significance	***		

#### Table F6. Attendance conditional on previous year attendance

The top panel presents the estimates of regressing student annual attendance rates on one year lagged student attendance rates, a dummy variable for the pandemic year, the interaction of the pandemic dummy with the share of days offered in person during the school year, the interaction of the pandemic dummy with school share of high needs students, the three-way interaction between pandemic-share of days in person-share high needs, and school fixed effects. Columns 1 through 3 present results for elementary, middle, and high school grades, respectively. The second panel presents results of a model that also includes the propensity score from the estimates in Table 2 interacted with the pandemic dummy. The bottom panel presents estimated effects of the pandemic on attendance based on the estimates in panel 2, separately for the 10th and 90th percentiles of share of days offered in person for both the 25th and 75th percentiles on share high needs represents the statistical significance of the share of days in person interaction with the pandemic dummy when share of high need students has been centered to take a value of zero at the 25th and 75th percentiles, respectively.

## Detailed findings from administrative data analysis: Effects on Standardized Test Scores in 2020-21

Tables F7 and F8 present the results for English Language Arts (ELA) and Mathematics (MATH) Smarter Balance test scores and universally administered SAT tests for 11th grade, respectively, using similar models to attendance except including a two-year lag of past test scores and three year lagged for 8<sup>th</sup> grade Smarter Balance scores for SAT. For both smarter balance ELA and Math tests, the pandemic has negative effects on test scores ranging from about 30% and 40% of a standard deviation decline for ELA and 40% and 60% for MATH for an entirely remote school with larger losses in the lower grades. The losses for the 11<sup>th</sup> grade SAT tests are substantially smaller at 15% and 25% of a standard deviation for ELA and Math. As with attendance, a higher share of days in person leads to significant reductions in these performance losses, except for the 11<sup>th</sup> grade SAT tests, with a modest erosion of these improvements in the model that includes the propensity score. Turning to the bottom panel, we used the estimates in panel 2 to compare the negative effects of the pandemic between schools at the 10<sup>th</sup> and 90<sup>th</sup> percentiles. At the 10<sup>th</sup> percentile, the losses range from 17% to 26% of a standard deviation for Smarter Balance ELA and 34% to 44% for Smarter Balance MATH again with larger losses in lower grades, and these losses fall to between 11% and 15% for ELA and 27% and 31% for MATH at the 90<sup>th</sup> percentile.

Tables F9 and F10 present the share high needs interaction models for ELA and MATH, respectively. Table F9 shows substantially larger learning losses on the ELA test for schools with a larger share of high needs students, but the results are a little more unstable when we add the propensity score control. Nonetheless, the bottom panel of Table F9 shows substantial differences of 8 percent of a standard deviation larger decline in 5<sup>th</sup> and 6<sup>th</sup> grade ELA scores and 5 percent larger decline for 8<sup>th</sup> grade ELA at the 75<sup>th</sup> percentile of school share high needs compared to the 25th percentile, when measured at the 10<sup>th</sup> percentile of share of days in person. As shown in Table F10, we did not find evidence of such differences between schools on the MATH test. Next, we looked at the triple interaction of pandemic, share days in person and share high needs as a test of whether in person learning matters more for high needs schools. The estimates on this interaction are only significant for one grade for one test, 6<sup>th</sup> grade ELA, out of eight estimates, and so that estimate should likely be discounted given the risk of type one error. Further, even though Panel 1 for ELA shows sizable, noisy estimates on ELA for other grades in the same direction as the significant 6<sup>th</sup> grade estimate, these other estimates erode in magnitude substantially when the propensity score interaction is added and no clear pattern remains. Again, we find minimal evidence that the positive effects of share of days offered in person are greater in Connecticut schools with larger shares of high need students.

	(1)	(2)	(3)	(4)	(5)				
Controls	Grade 5	Grade 6	Grade 7	Grade 8	Grade 11				
No Propensity Score									
Lagged Score	0.835***	0.784***	0.815***	0.822***	0.796***				
	(0.00286)	(0.00295)	(0.00317)	(0.00339)	(0.00719)				
Den domia voon	- 20.05***	- 70 10***	- 27 07***	- 01 21***	15 17***				
Pandemic year	(2,405)	(2.514)	(2, 895)	(2, 225)	-13.47				
Dendemiserer *Channelder in mennen	(2.493)	(2.314)	(2.003)	(3.223)	(2.716)				
Pandemic year "Share of days in person	28.70***	15.24***	14./9***	$14.41^{+++}$	-4./11				
	(3.480)	(3.816)	(4./20)	(5.153)	(5.036)				
Observations	138 378	139 262	140 129	143 337	93 322				
R-squared	0.686	0.674	0.671	0.663	0.661				
	0.000	01071	01071	0.000	0.001				
Conditional on Center	ed Propensity	y Score							
Lagged Score	0.835***	0.784***	0.815***	0.822***	0.796***				
	(0.00284)	(0.00294)	(0.00317)	(0.00338)	(0.00719)				
	-	-	-	-					
Pandemic year	37.22***	27.71***	25.33***	22.74***	-15.70***				
	(2.412)	(2.408)	(2.795)	(3.035)	(2.710)				
Pandemic year*Share of days in person	23.92***	13.84***	11.60**	11.41**	-4.336				
	(3.373)	(3.634)	(4.536)	(4.906)	(5.031)				
Pandemic year*Centered propensity score	23.58***	8.907**	16.83***	19.65**	16.87				
	(4.082)	(4.300)	(4.810)	(7.649)	(11.00)				
Observations	138,378	139,262	140,129	143,337	93,322				
R-squared	0.687	0.674	0.671	0.664	0.661				
Average ELA Test Scores 2016-17, 2017-18,	2510.2	2520 7	25617	2577 (	520.5				
2018-19 Stendard Deviation of ELA Test Secret Control	2519.2	2539.7	2561.7	2577.6	520.5				
Vears	97.0	96.6	101.3	100.8	104 7				
Average ELA Test Scores 2020-21	2501 4	2522.5	2547.4	2565 7	512.2				
Standard Deviation of ELA Test Scores 2020-21	103.5	00.5	104.8	106.1	103.0				
10th Percentile Share In-Person Days through	105.5	99.5	104.0	100.1	105.9				
April	0.414	0.397	0.414	0.414	0.400				
90th Percentile Share In-Person Days through									
April	1.000	0.964	0.933	0.933	0.783				
Pandemic Effects at 10th Percentile Share In-									
Person Days	-27.32	-22.17	-20.69	-18.18	-17.43				
Pandemic Effects at 90th Percentile Share In-	10.00	14.00		10.00	10.00				
Person Days	-13.30	-14.80	-14.51	-12.09	-19.09				

#### Table F7. English Language Arts Test Score Effects

The top panel presents the estimates of regressing Smarter Balance ELA scale scores on two year lagged ELA scores, a dummy variable for the pandemic year, the interaction of the pandemic dummy with the share of days offered in person through April of the school year, and school fixed effects. Columns 1 through 4 present results for 5th, 6th, 7th and 8th grades, respectively. The second panel presents results of a model that also includes the propensity score from the estimates in Table 2 interacted with the pandemic dummy. The bottom panel present the average

and standard deviation of ELA scores both pre-pandemic and in 2020-21, the 10th and 90th percentiles of share of days offered in person through April, and estimated effects of the pandemic based on the estimates in panel 2 calculated at the 10th and 90th percentile share of days.

	(1)	(2)	(3)	(4)					
Controls	Grade 5	Grade 6	Grade 7	Grade 8	Grade 11				
No Propensity Score									
Lagged Score	0.888***	1.032***	0.996***	0.928***	0.759***				
	(0.00435)	(0.00422)	(0.00512)	(0.00711)	(0.0102)				
Pandemic year	-56.26***	-60.33***	-47.21***	-44.82***	-24.72***				
	(2.941)	(3.279)	(3.318)	(4.028)	(2.838)				
Pandemic year*Share of days in person	31.80***	28.63***	18.54***	12.91**	-2.925				
	(4.062)	(4.903)	(5.185)	(5.963)	(5.327)				
		100 101							
Observations	137,887	138,486	138,971	141,927	93,163				
K-squared	0.734	0.754	0.750	0.744	0.717				
Lagged Sager	o ooo***	1 022***	0 006***	0 0 0 0 * * *	0 750***				
Lagged Score	$0.888^{+++}$	$1.032^{++++}$	0.990****	$0.928^{++7}$	$0.739^{***}$				
Dan damia yaan	(0.00433)	(0.00421)	(0.00512)	(0.00/11)	(0.0102)				
Pandemic year	$-33.49^{11}$	-39.23	-40.41	$-43.30^{-11}$	-24.89				
Dandamia yoar*Shara of days in narson	(2.701)	(3.238) 26.65***	(3.103) 17.04***	(3.730) 10.26*	(2.830)				
Pandemic year share of days in person	$(2.92^{+++})$	(4, 757)	1/.04	$10.30^{\circ}$	-2.035				
Pandomia year*Contered propensity seere	(3.033)	(4.737) 12.47***	(4.910)	(3.334) 16 10**	(3.323)				
Fandenne year Centered propensity score	(4.001)	(4.276)	(6.252)	(7, 812)	(10.00)				
	(4.991)	(4.270)	(0.332)	(7.012)	(10.90)				
Observations	137,887	138,486	138,971	141.927	93,163				
R-squared	0.735	0.754	0.750	0.744	0.717				
· ·					<u> </u>				
Average of Math Test Scores 2018-19	2512.3	2532.2	2547.7	2561.7	506.7				
Standard Deviation of Math Test Scores 2018-19	91.7	105.2	111.4	119.6	111.1				
Average of Math Test Scores 2020-21	2487.1	2504.1	2529.3	2539.7	498.5				
Standard Deviation of Math Test Scores 2020-21	96.4	109.3	109.6	119.7	109.9				
10th Percentile Share In-Person Days through									
April	0.414	0.400	0.414	0.414	0.400				
90th Percentile Share In-Person Days through									
April	1.000	0.964	0.933	0.933	0.783				
Pandemic Effects at 10th Percentile In-Person	-42.35	-48.59	-39.59	-39.36	-25.95				
Pandemic Effects at 90th Percentile In-Person	-26.57	-34.39	-30.51	-33.83	-26.97				

#### Table F8. Mathematics Test Score Effects

The top panel presents the estimates of regressing Smarter Balance Math scale test scores on two year lagged Math scores, a dummy variable for the pandemic year, the interaction of the pandemic dummy with the share of days offered in person through April of the school year, and school fixed effects. Columns 1 through 4 present results for 5th, 6th, 7th and 8th grades, respectively. The second panel presents results of a model that also includes the propensity score from the estimates in Table 2 interacted with the pandemic dummy. The bottom panel present the average and standard deviation of ELA test scores both pre-pandemic and in 2020-21, the 10th and 90th percentiles of share of days offered in person through April, and estimated effects of the pandemic based on the estimates in panel 2 calculated at the 10th and 90th percentile share of days.

	(1)	(2)	(3)	(4)	(5)
Controls	Grade 5	Grade 6	Grade 7	Grade 8	Grade 11
	No Proper	nsity Score			
Lagged Score	0.835***	0.784***	0.815***	0.822***	0.796***
66	(0.00286)	(0.00295)	(0.00317)	(0.00338)	(0.00719)
Pandemic year*Share high need students	-30.36**	-37.46***	-18.91	-30.77**	-14.18
	(11.80)	(11.32)	(11.61)	(15 15)	(14.58)
Pandemic vear*Share high need	(11.00)	(11.52)	(11.01)	(10.10)	(11.00)
students*	14.73	44.99***	17.05	28.78	32.60
In Person learning option	(16.02)	(16.40)	(18.65)	(22.71)	(24.89)
	( )	× ,	( )	× ,	( )
Observations	138,378	139,262	140,129	143,337	93,322
R-squared	0.687	0.674	0.671	0.664	0.661
<b>.</b>					
Condit	ional on Cente	ered Propensity	/ Score		
Lagged Score	0.835***	0.784***	0.815***	0.822***	0.796***
66	(0.00285)	(0.00294)	(0.00317)	(0.00338)	(0.00719)
Pandemic year*Share high need students	-19 66*	-33 46***	-1 860	-18 31	-1 883
	(11.87)	(10.58)	(12.76)	(15.03)	(12.87)
Pandemic vear*Share high need	(11.07)	(10.00)	(12.70)	(10.00)	(12.07)
students*	6.962	41.55***	2.425	18.78	32.34
In Person learning option	(15.52)	(15.33)	(18.61)	(21.68)	(22.53)
Pandemic year*Centered propensity	~ /	× ,			× /
score	12.89***	3.968	16.56***	14.82*	43.67***
	(4.672)	(4.716)	(5.785)	(8.924)	(11.65)
Observations	138,378	139,262	140,129	143,337	93,322
R-squared	0.687	0.674	0.671	0.664	0.661
25th Percentile High Needs					
Pandemic Effects 10 Percentile In-	-21.68	16.53	-20.40		
Person	-21.00	-10.55	-20.40	-14.79	-19.44
Pandemic Effects 90th Percentile In-					•• • • •
Person	-11.46	-16.44	-14.62	-12.39	-22.00
In Person Option Interaction	* * *		*		
Significance	-111-				
/ Sin Percentile High Needs					
Person	-30.00	_24.81	-20.80	-19 378	-15.06
Pandemic Effects 90th Percentile In-	-30.00	-24.01	-20.00	-19.370	-13.70
Person	-17.76	-13.82	-14.44	-12.72	-14.63
In-Person Option Interaction	1,	10.02			1
Significance	***	***	**	**	

#### Table F9. English Language Arts Test Score Effects by Share High Needs

The top panel presents the estimates of regressing Smarter Balance ELA scale test scores on two year lagged ELA scores, a dummy variable for the pandemic year, the interaction of the pandemic dummy with the share of days offered in person through April, the interaction of the pandemic dummy with school share of high needs students, the three-way interaction between pandemic-share in person-share high needs, and school fixed effects. Columns 1 through 4

present results for 5th, 6th, 7th and 8th grades, respectively. The second panel presents results of a model that also includes the propensity score from the estimates in Table 2 interacted with the pandemic dummy. The bottom panel presents estimated effects of the pandemic on attendance based on the estimates in panel 2, separately for the 10th and 90th percentiles of share of days offered in person for both the 25th and 75th percentiles of school share of high needs students. The bottom rows under 25th and 75th percentiles share high needs represents the statistical significance of the share of days interaction with the pandemic dummy when share high needs has been centered to take a value of zero at the 25th and 75th percentiles, respectively.

	•	8			
	(1)	(2)	(3)	(4)	(5)
Controls	Grade 5	Grade 6	Grade 7	Grade 8	Grade 11
]	No Propensity	Score			
Lagged Score	0.888***	1.032***	0.996***	0.928***	0.759***
	(0.00435)	(0.00422)	(0.00513)	(0.00712)	(0.0102)
Pandemic year*Share high need students	-6.163	-15.05	3.193	-15.64	3.308
	(15.10)	(13.92)	(16.23)	(20.12)	(15.63)
Pandemic year*Share high need students*	-14.05	14.57	9.914	36.90	-0.654
In Person learning option	(20.44)	(19.97)	(25.86)	(29.50)	(26.83)
Observations	137,887	138,486	138,971	141,927	93,163
R-squared	0.735	0.754	0.750	0.744	0.717
Conditiona	l on Centered	Propensity Sc	core		
Lagged Score	0.887***	1.032***	0.996***	0.928***	0.759***
	(0.00434)	(0.00421)	(0.00513)	(0.00712)	(0.0102)
Pandemic year*Share high need students	10.70	-2.801	19.72	6.628	8.316
	(13.39)	(14.26)	(13.92)	(16.82)	(15.47)
Pandemic year*Share high need students*	-26.30	3.944	-4.301	18.83	2.083
In Person learning option	(17.90)	(19.50)	(22.81)	(25.14)	(26.15)
Pandemic year*Centered propensity score	20.30***	12.17**	16.06**	26.45***	28.10**
	(6.110)	(4.850)	(6.926)	(8.119)	(10.84)
Observations	137,887	138,486	138,971	141,927	93,163
R-squared	0.735	0.754	0.750	0.744	0.717
25th Percentile High Needs					
Pandemic Effects 10 Percentile In-Person	-42.64	-48.16	-54.06	-43.17	-27.87
Pandemic Effects 90th Percentile In-Person	-23.76	-34.58	-32.61	-37.86	-27.86
	***	***	***		
75th Percentile High Needs					
Pandemic Effects 10 Percentile In-Person	-42.73	-48.77	-45.15	-37.14	-25.01
Pandemic Effects 90th Percentile In-Person	-31.44	-34.15	-25.51	-27.55	-24.75
In Person Option Interaction Significance	***	***	**	**	

#### Table F10. Math Test Score Effects by Share High Needs

The top panel presents the estimates of regressing Smarter Balance Math scale test scores on two year lagged Math scores, a dummy variable for the pandemic year, the interaction of the pandemic dummy with the share of days offered in person through April, the interaction of the pandemic dummy with school share of high needs students, the three-way interaction between pandemic-share in person-share high needs, and school fixed effects. Columns 1 through 4 present results for 5th, 6th, 7th and 8th grades, respectively. The second panel presents results of a model that also includes the propensity score from the estimates in Table 2 interacted with the pandemic dummy. The bottom panel presents estimated effects of the pandemic on attendance based on the estimates in panel 2, separately for the 10th and 90th percentiles of share of days offered in person for both the 25th and 75th percentiles of school share of high needs students. The bottom rows under 25th and 75th percentiles shares high needs represents the statistical significance of the share of days in person with the pandemic dummy when share high needs has been centered to take a value of zero at the 25th and 75th percentiles, respectively.

#### Detailed findings from administrative data analysis: Falsification Tests

In this section, we present falsification tests for the main results on enrollment from Table F3, attendance from Table F5, and ELA and Math test scores from Tables F7 and F8. We treated 2019-20 as the fake pandemic year for enrollment, and 2018-19 as the fake pandemic year for other outcomes. The sample sizes are reduced in the falsification as compared to the main analyses except for the enrollment falsification because we do not have a full three years of data with lagged outcomes prior to the 2018-2019 fake pandemic year.

Table F11 presents falsification tests for enrollment. All estimates are insignificant and very small, ranging between 0.1 and 0.2 percentage points. Table F12 presents the falsification tests for attendance. Only one estimate out of the 12 estimates on the pandemic dummy and the dummy interacted with share in person is significant and only at the 10% level. All estimates are substantially smaller than the estimates in Table F5 and the largest estimates are in the opposite direction of our main estimates.

Turning to the falsification tests for test scores, Table F13 for ELA and Table F14 for Math, we do observe that there are trends in test score performance that lead to a significant effect of the fake pandemic year on test scores, but again these estimates are modest in size in terms of estimates of actual test score losses during the pandemic and in the opposite direction for ELA. Therefore, at worst, the estimated losses during the pandemic are understated somewhat for ELA and overstated somewhat for Math, which might explain part of the larger losses during the pandemic in Math test scores relative to ELA scores. Turning to the estimated effects of in person learning opportunities on test scores, all but one of 20 estimates are insignificant and the one significant estimate is only at the 10% level of significance. This marginally significant estimate is substantially larger than most of the falsification estimates for test scores and is still only about <sup>1</sup>/<sub>4</sub> the size of the actual estimate from Table F8.

Therefore, we conclude that our results cannot be explained by pre-existing differences in trends between districts that tended to provide more in person learning options and those that did not.

	(1)	(2)	(3)
Controls	Grades 1st through 5th	Grades 6th through 8th	Grades 9th through 12th
Unweighted	d Model		
Pandemic year	-0.000806	-0.00119	-0.00193
	(0.00152)	(0.00116)	(0.00138)
Pandemic year*In person learning option in Sept	0.000997	0.000766	0.00192
	(0.00161)	(0.00129)	(0.00150)
Observations	733,573	471,798	636,971
R-squared	0.012	0.282	0.407
Propensity Sco	ore Weight		
Pandemic year	-0.00112	-0.00122	-0.00112
	(0.00170)	(0.00120)	(0.00128)
Pandemic year*In person learning option in Sept	0.000992	0.00159	0.00129
	(0.00184)	(0.00158)	(0.00175)
Observations	733 573	471 798	636 971
R-squared	0.015	0.264	0.259

#### Table F11. Falsification of In-Person Learning Effects on Enrollment

The table presents falsification tests dropping the pandemic year and treating 2018-19 as a fake pandemic year. The top panel presents the estimates of regressing whether students enrolled at the beginning of previous school year also enrolled for the current year (including the pandemic year) on a dummy variable for the pandemic year, the interaction of the pandemic dummy with the share of days offered in person through April of the school year, and school fixed effects. Columns 1 through 4 present results for 5th, 6th, 7th and 8th grades, respectively. The second panel presents results of a model that that is weighted by the inverse of the propensity score from the estimates in Table 1.

Controls	Grades 2nd through	Grades 6th through	Grades 9th through
Controis	Sth	8th	12th
Lagged Attendance	0.346***	0.591***	0.602***
	(0.0220)	(0.0134)	(0.0235)
Pandemic year	-0.00143	-0.00235	0.00495
	(0.000990)	(0.00149)	(0.00394)
Pandemic year*Share of days in person	-0.000531	0.00167	-0.0105
	(0.00135)	(0.00218)	(0.00653)
Observations	293,937	223,552	297,085
R-squared	0.223	0.272	0.31
	Centered Propensity Sco	ore	
Lagged Attendance	0.346***	0.590***	0.601***
	(0.0219)	(0.0134)	(0.0235)
Pandemic year	-0.000662	-0.00162	0.00503
	(0.00104)	(0.00148)	(0.00397)
Pandemic year*Share of days in person	-0.00175	0.000203	-0.0111*
	(0.00143)	(0.00218)	(0.00662)
Pandemic year*Centered propensity score	0.00514***	0.00616**	0.0509
	(0.00185)	(0.00294)	(0.0335)
Observations	293,937	223,552	297,085
R-squared	0.224	0.272	0.310

#### Table F12. Falsification Tests for In-Person Learning Effects on Attendance

The table presents falsification tests dropping the pandemic year and treating 2018-19 as a fake pandemic year. The top panel presents the estimates of regressing attendance rates on two year lagged rates, a dummy variable for the pandemic year, the interaction of the pandemic dummy with the share of days offered in person through April of the school year, and school fixed effects. Columns 1 through 4 present results for 5th, 6th, 7th and 8th grades, respectively. The second panel presents results of a model that also includes the propensity score from the estimates in Table 2 interacted with the pandemic dummy.

	(1)	(2)	(3)	(4)	(5)					
Controls	Grade 5	Grade 6	Grade 7	Grade 8	Grade 11					
No Propensity Score										
Lagged Score	0.844***	0.790***	0.823***	0.839***	0.803***					
	(0.00350)	(0.00343)	(0.00373)	(0.00414)	(0.00666)					
Pandemic year	7.144***	2.014	8.001***	9.236***	-7.263***					
	(2.503)	(2.289)	(2.647)	(2.971)	(2.605)					
Pandemic year*Share of days in person	1.566	4.055	-2.033	-2.228	4.994					
	(3.494)	(3.370)	(4.186)	(4.261)	(4.717)					
Observations	69,648	71,274	71,188	72,653	64,237					
R-squared	0.694	0.678	0.682	0.669	0.665					
C	Centered Proper	nsity Score								
Lagged Score	0.843***	0.790***	0.822***	0.838***	0.803***					
	(0.00352)	(0.00343)	(0.00373)	(0.00413)	(0.00665)					
Pandemic year	5.824**	1.774	6.530**	9.203***	-7.262***					
	(2.558)	(2.365)	(2.548)	(2.946)	(2.608)					
Pandemic year*Share of days in person	3.935	4.424	0.595	-2.272	4.991					
	(3.652)	(3.532)	(4.127)	(4.193)	(4.720)					
Pandemic year*Centered propensity score	-14.38***	-2.357	-13.22***	-1.024	-3.456					
	(5.048)	(3.635)	(4.038)	(5.692)	(17.66)					
Observations	69,817	71,439	71,369	72,855	64,237					
R-squared	0.695	0.679	0.683	0.670	0.665					

Table F13. Falsification Tests for In-person Learning Effects on ELA Test Scores

The table presents falsification tests dropping the pandemic year and treating 2018-19 as a fake pandemic year. The top panel presents the estimates of regressing Smarter Balance ELA scale test scores on two year lagged ELA scores, a dummy variable for the pandemic year, the interaction of the pandemic dummy with the share of days offered in person through April of the school year, and school fixed effects. Columns 1 through 4 present results for 5th, 6th, 7th and 8th grades, respectively. The second panel presents results of a model that also includes the propensity score from the estimates in Table 2 interacted with the pandemic dummy.

	(1)	(2)	(3)	(4)	(5)						
Controls	Grade 5	Grade 6	Grade 7	Grade 8	Grade 11						
No Propensity Score											
Lagged Score	0.902***	1.041***	1.012***	0.942***	0.765***						
	(0.00493)	(0.00507)	(0.00525)	(0.00753)	(0.00997)						
Pandemic year	-6.535**	-7.849**	-6.014**	-6.794*	-13.85***						
	(3.067)	(3.390)	(2.822)	(3.699)	(2.871)						
Pandemic year*Share of days in person	6.367	-0.141	1.605	-1.747	5.713						
	(4.146)	(5.092)	(4.210)	(5.555)	(5.301)						
Observations	69,666	71,208	71,013	72,429	64,149						
R-squared	0.738	0.757	0.760	0.748	0.718						
C	entered Proper	nsity Score									
Lagged Score	0.900***	1.040***	1.011***	0.941***	0.765***						
	(0.00496)	(0.00507)	(0.00526)	(0.00753)	(0.00997)						
Pandemic year	-7.131**	-7.640**	-6.306**	-7.019*	-13.83***						
	(3.106)	(3.424)	(2.886)	(3.712)	(2.863)						
Pandemic year*Share of days in person	7.505*	-0.469	2.077	-1.322	5.679						
	(4.258)	(5.173)	(4.317)	(5.562)	(5.238)						
Pandemic year*Centered propensity score	-6.766	1.332	-2.562	-3.791	15.48						
	(5.604)	(5.436)	(4.299)	(6.411)	(19.02)						
Observations	69,831	71,368	71,191	72,620	64,149						
R-squared	0.739	0.758	0.760	0.749	0.718						

Table F14. Falsification Tests for In-person Learning Effects on Math Test Scores

The table presents falsification tests dropping the pandemic year and treating 2018-19 as a fake pandemic year. The top panel presents the estimates of regressing Smarter Balance ELA scale test scores on two year lagged Math scores, a dummy variable for the pandemic year, the interaction of the pandemic dummy with the share of days offered in person through April of the school year, and school fixed effects. Columns 1 through 4 present results for 5th, 6th, 7th and 8th grades, respectively. The second panel presents results of a model that also includes the propensity score from the estimates in Table 2 interacted with the pandemic dummy.

#### **District Inventory Indicators of Remote Learning Conditions**

						Distri	ct Type		·
	-	Overall		Alliance	Alliance districts		Non-Alliance districts		SEPs
	-	Valid	Valid	Valid	Valid	Valid	Valid	Valid	Valid
		Count	Percent	Count	Percent	Count	Percent	Count	Percent
Elementary	Fully asynchronous	35	18.0	7	21.9	25	19.5	3	8.8
School	Partially or fully synchronous	159	82.0	25	78.1	103	80.5	31	91.2
	Total	194	100.0	32	100.0	128	100.0	34	100.0
Middle	Fully asynchronous	32	17.0	5	16.1	23	19.3	4	10.5
School	Partially or fully synchronous	156	83.0	26	83.9	96	80.7	34	89.5
	Total	188	100.0	31	100.0	119	100.0	38	100.0
High	Fully asynchronous	30	17.4	5	16.7	19	19.4	6	13.6
School	Partially or fully synchronous	142	82.6	25	83.3	79	80.6	38	86.4
	Total	172	100.0	30	100.0	98	100.0	44	100.0

#### Table F15. Remote learning conditions: Access to synchronous instruction in spring 2020 (district inventory indicator 1)

Please note that response options in this table were created by combining data from district inventory Q5; detailed results for Q5 are available in Table C5. In this table, Asynchronous is a combination of "Fully Asynchronous without Technology" with "Fully Asynchronous with Technology"; Synchronous is a combination of "Partially Synchronous" with "Fully Synchronous". (Derived variables: Q5e r, Q5m r, Q5h r).

#### Table F16. Remote learning conditions: Access to remote learning technology in spring 2020 (district inventory indicator 2)

		District Type											
		Overall		Alliance districts			Non-Alliance districts				APSEPs		
	Mean			Mean		Mean			Mean				
	Ν	Percent	(SD)	Ν	Percent	(SD)	Ν	Percent	(SD)	Ν	Percent	(SD)	
Elementary School	180	75.6	(20.1)	27	65.4	(25.5)	124	79.8	(16.7)	29	67.4	(22.3)	
Middle School	174	78.7	(19.2)	25	68.8	(26.8)	115	83.4	(14.3)	34	70.0	(21.5)	
High School	164	79.8	(18.8)	26	70.8	(24.3)	97	84.6	(12.8)	41	74.0	(23.1)	

Please note that the data in this table were created by combining data from district inventory Q23 (percentage of students with adequate internet access as of March 1, 2020; detailed results in Table D35) and Q41 (percentage of students with access to a digital device for remote learning as of March 1, 2020; detailed results in Tables D22, D26, and D30); for Q41, we used the higher value of two options: <u>district-provided</u> Chromebooks, laptops, or iPads or <u>family-provided</u> Chromebooks, laptops, or iPads. The values in this table represent the mean of each participating district's reported values for these two items. (Derived variables: SAC1e p, SAC1m p, SAC1h p.)

			District Type									
		Ove	erall	Alliance	Alliance districts		Non-Alliance districts		APSEPs			
		Valid Number	Valid Percent	Valid Number	Valid Percent	Valid Number	Valid Percent	Valid Number	Valid Percent			
		of Districts	of Districts	of Districts	of Districts	of Districts	of Districts	of Districts	of Districts			
Number of	1	0	.0	0	.0	0	.0	0	.0			
Activities	2	2	.9	0	.0	1	.7	1	2.0			
	3	2	.9	0	.0	0	.0	2	4.0			
	4	13	5.8	1	3.1	5	3.5	7	14.0			
	5	15	6.7	3	9.4	10	7.1	2	4.0			
	6	26	11.7	0	.0	16	11.3	10	20.0			
	7	43	19.3	6	18.8	22	15.6	15	30.0			
	8	31	13.9	3	9.4	22	15.6	6	12.0			
	9	42	18.8	7	21.9	29	20.6	6	12.0			
	10	49	22.0	12	37.5	36	25.5	1	2.0			
	Total N	223	100.0	32	100.0	141	100.0	50	100.0			

#### Table F17. Remote learning conditions: Summer 2020 preparation for fall (district inventory indicator 3)

Please note that the data in this table represent the number of 10 listed activities conducted between the last student day of spring 2020 and students' return to school in fall 2020, as reported by districts in District Inventory Q15; detailed data for Q15 is presented in Tables E3, E31 and E42. (Derived variable: Q15count).

		District Type							
		Ove	erall	Alliance	districts	Non-Allian	ce districts	APSEPs	
		Valid Number	Valid Percent	Valid Number	Valid Percent	Valid Number	Valid Percent	Valid Number	Valid Percent
		of Districts	of Districts	of Districts	of Districts	of Districts	of Districts	of Districts	of Districts
Number of Elementary	0	2	1.1	0	.0	0	.0	2	7.1
School Activities	1	3	1.6	1	3.0	2	1.6	0	.0
	2	14	7.6	3	9.1	7	5.6	4	14.3
	3	18	9.7	0	.0	14	11.3	4	14.3
	4	25	13.5	1	3.0	20	16.1	4	14.3
	5	33	17.8	6	18.2	24	19.4	3	10.7
	6	35	18.9	10	30.3	21	16.9	4	14.3
	7	55	29.7	12	36.4	36	29.0	7	25.0
	Total N	185	100.0	33	100.0	124	100.0	28	100.0
Number of Middle	0	3	1.7	0	.0	0	.0	3	9.1
School Activities	1	6	3.3	1	3.2	4	3.4	1	3.0
	2	9	5.0	1	3.2	4	3.4	4	12.1
	3	19	10.6	1	3.2	12	10.3	6	18.2
	4	25	13.9	2	6.5	18	15.5	5	15.2
	5	40	22.2	6	19.4	30	25.9	4	12.1
	6	32	17.8	9	29.0	20	17.2	3	9.1
	7	46	25.6	11	35.5	28	24.1	7	21.2
	Total N	180	100.0	31	100.0	116	100.0	33	100.0
Number of High School	0	3	1.7	0	.0	0	.0	3	7.0
Activities	1	8	4.7	1	3.2	3	3.1	4	9.3
	2	7	4.1	0	.0	3	3.1	4	9.3
	3	17	9.9	1	3.2	9	9.2	7	16.3
	4	27	15.7	1	3.2	18	18.4	8	18.6
	5	34	19.8	7	22.6	23	23.5	4	9.3
	6	31	18.0	8	25.8	17	17.3	6	14.0
	7	45	26.2	13	41.9	25	25.5	7	16.3
	Total N	172	100.0	31	100.0	98	100.0	43	100.0

Table F18. Remote learning conditions: District improvements in remote learning (district inventory indicator 4)

Please note that the data in this table represent a count of improvements in remote learning from 2019-20 to 2020-21, as reported by districts in District Inventory Q36; detailed results for Q36 are available in Tables C65, C66, and C67. (Derived variables: Q36e\_c, Q36m\_c, Q36h\_c.)

		District Type							
		Ove	erall	Alliance	districts	Non-Allian	ce districts	APS	EPs
		Valid Number	Valid Percent	Valid Number	Valid Percent	Valid Number	Valid Percent	Valid Number	Valid Percent
		of Districts	of Districts	of Districts	of Districts	of Districts	of Districts	of Districts	of Districts
Number of Elementary	0	2	1.1	0	.0	1	.8	1	3.4
School Assessments	1	2	1.1	1	3.1	0	.0	1	3.4
	2	2	1.1	0	.0	1	.8	1	3.4
	3	6	3.2	0	.0	4	3.2	2	6.9
	4	16	8.6	3	9.4	9	7.1	4	13.8
	5	21	11.2	5	15.6	13	10.3	3	10.3
	6	138	73.8	23	71.9	98	77.8	17	58.6
	Total N	187	100.0	32	100.0	126	100.0	29	100.0
Number of Middle	0	1	.6	0	.0	0	.0	1	2.9
School Assessments	1	1	.6	0	.0	0	.0	1	2.9
	2	3	1.7	2	6.7	1	.9	0	.0
	3	12	6.7	0	.0	7	6.1	5	14.3
	4	23	12.8	4	13.3	14	12.2	5	14.3
	5	33	18.3	6	20.0	23	20.0	4	11.4
	6	107	59.4	18	60.0	70	60.9	19	54.3
	Total N	180	100.0	30	100.0	115	100.0	35	100.0
Number of High School	0	2	1.2	0	.0	0	.0	2	4.9
Assessments	1	0	.0	0	.0	0	.0	0	.0
	2	7	4.1	2	6.5	1	1.0	4	9.8
	3	13	7.6	1	3.2	6	6.1	6	14.6
	4	27	15.9	3	9.7	17	17.3	7	17.1
	5	43	25.3	9	29.0	26	26.5	8	19.5
	6	78	45.9	16	51.6	48	49.0	14	34.1
	Total N	170	100.0	31	100.0	98	100.0	41	100.0

Table F19. Remote learning conditions: Rigor of student assessment in 2020-21 (district inventory indicator 5)

Please note that this table reports a weighted count of up to 6 based on district-reported student assessment practices (District Inventory Q42; detailed data in Tables C22, C23, and C24) and grading practices (District Inventory Q44; detailed data in Tables C40, C43, and C46) during the 2020-21 school year. Specifically, we assigned 1 point for each of the following assessment types reported by districts: in-class assignments, quizzes/tests, diagnostic ELA assessments, and diagnostic math assessments (up to 4 points) and we assigned a score of 0-2 for the rigor of grading practices (0 if a district selected "Grading was suspended" and/or "Pass/fail" AND neither "Proficiency" and/or "Letter grades" was selected; 1 if a district selected "Proficiency" and/or "Letter grades" AND "Grading was suspended" and/or "Pass/fail"; and 2 if a district selected "Proficiency" and/or "Letter grades" or "Pass/fail.") (Derived variables: SA3e\_c, SA3m\_c, SA3h\_c.)

		District Type										
	Overall			Alliance districts N		Non-	Non-Alliance districts		APSEPs			
	Ν	Mean	(SD)	N	Mean	(SD)	Ν	Mean	(SD)	Ν	Mean	(SD)
Non-Academic/Social Supports referrals for students in school year 2020- 21	215	3.7	(.7)	31	3.9	(.9)	135	3.8	(.6)	49	3.2	(.7)

Table F20. Remote learning conditions: Social services referrals for students in 2020-21 (district inventory indicator 6)

Please note that the means in this table present the average of two variables: district inventory Q20 (the amount of resources allocated to social services referrals during 2020-21, compared to before the pandemic) and Q21 (the number of students referred for social services in 2020-21 compared to before the pandemic). 1 = a lot less resources/students to 5 = a lot more resources/students. Details results for Q20 and Q21 are presented in Tables D45 and D46. (Derived variable: NASS.)

# Q4b. What do teachers say about the association of learning models and conditions with student attendance and performance?

See narrative for results.

## Q4c. How were remote learning models and conditions associated with changes in student attendance and performance on standardized assessments?

As described in the pre-analysis plan, we pooled all data and grades for each of the four outcomes considered estimating separate coefficients on the district inventory indicator for each outcome. For attendance and chronic absence, we pooled all grades 1<sup>st</sup>-12<sup>th</sup>, but estimated separate estimates on the district inventory indicator for 1<sup>st</sup> & 2<sup>nd</sup> grades, 3<sup>rd</sup> grade through the end of elementary school, middle school and high school, where the grades associated with each grade span were based on the reports in the district inventory. For test scores, we pooled all scores treating ELA and Math scores for the same grade and year as separate observations and estimated a separate estimate on the inventory indicator for each grade between 5<sup>th</sup> and 8<sup>th</sup> plus 11<sup>th</sup> grade for both ELA and Math scores, a total of 10 separate estimates. We then conducted an F-test for whether we could reject the null hypothesis that all of the estimates associated with a specific indicator and student outcome are zero.

Table F21 presents the results of these F-test along with Bonferroni corrections to these F-tests to address concerns about type I error given the large number of hypotheses being tested, as discussed in the pre-analysis plan above. Each column represents one of our six indicators created based on the district inventory data. The first column is an indicator whether learning in spring 2020 was synchronous with a 1 representing partially or fully synchronous and a 0 representing fully asynchronous learning. Approximately 75 percent of districts offered partially or fully synchronous. The second column captures the self-report of the fraction of students that had online access during spring 2020. Across districts, the estimates range between 20 and 100% of students, and on average districts reported approximately 75 percent of students had access. The third indicator is summer preparation which represents a sum from 2 to 10 of the number of actions selected by districts as activities undertaken in the summer of 2020 in preparation for the 2020-21 school year with a mean across districts of 8.5 activities, including activities like building improvements, new online resources, or teacher training. The fourth indicator captures information on the rigor of assessment models used by districts in 2020-21. This index ranges between 0 and 6 where 0 is all grading suspended or pass fail and minimal evaluation of assignments, tests or other assessments, and 6 is no use of pass/fail or suspension of grading and use of a full range of assessment tools. The average across all districts was 5.4. Indicator 5 is based on averaging Likert scales for increases in resources allocated to identifying and referring students to social services and for increases in the number of students referred. The scale runs from 1 to 5 with a 1 representing the largest increase and 5 representing large decreases, and the district mean is 2. The final column (indicator 6) is for reported improvements in online learning for the 2020-21 school year with the index ranging from 1 to 7 with a mean of 5.7 and a higher number implying greater improvements.

The statistical models are difference-in-differences models as described in the pre-analysis plan conditioned on school fixed effects for each grade or grade span and in the case of test scores by ELA vs Math. However, we departed from the basic difference-in-differences models for both online access in spring 2020 and improvements in online learning in 2020-21. The reason for the departure is illustrated in the second panel of Table F21, which shows the correlation between the district inventory indicator and both share of days offered in person and share of high needs students. For both of these indicators, the correlation with share high needs is quite high. Therefore, following the approaches for administrative data analysis (described at the start of this appendix), we developed propensity scores for online access spring 2020 and improvements in online learning as a function of the type of Local Educational Authority (LEA) and the share of high needs students, allowing the influence of share high needs to vary with the type of LEA. We estimated a two-sided Tobit for online access since access is bound between 0% and 100% of students, and an ordered probit for improvements in online learning given the discrete values between 1 and 7. Given continuous treatment for online access, we included the propensity score interacted with the pandemic dummy. For the ordered probit, we could use inverse propensity score weighting except we regularized the weights by scaling by the unconditional probability of each outcome, which preserves the original sample distribution of outcomes across the 7 possible values. For all other district inventory indicators, the correlation with share high needs and share of days offered in person is small.

As described in our pre-analysis plan, we had intended to allow the effect of improvements in online learning to vary with the share of days that were offered in person. However, those estimates were very unstable due to multicollinearity between the pandemic effect of improvements in online learning and a control for how the effect of these improvements varied with the share of days offered online by districts. Essentially, the direct effect of improvements and the interaction of improvements with share of days online were always opposite in sign, and switching from negative to positive across grades with no discernable pattern. As a result, we made a second departure from our pre-analysis plan: we dropped the triple interaction term and focused solely on the interaction of *improvements in online learning* with the pandemic dummy, which is the same model used for the other five district inventory indicators.

The resulting F-tests are shown in the third panel of Table 21. We can immediately rule out any correlation between three indicators—*synchronous spring 2020, summer preparation,* and *improvements in online learning*—because none of the individual F-tests were significant at the 5% level of confidence even before any corrections associated with the many hypothesis tests conducted. These three columns received an X in the last row of the table indicating that the results are clearly insignificant.

The *social services referrals* indicator yielded the F-test that rejects the null hypothesis of no effects with the most confidence. Following our pre-analysis plan, we first corrected for type 1 error within each column or for each district inventory indicator, as shown in the fourth panel of Table F21. Multiplying the p-value on test score proficiency by 4 for the social services referrals indicator yielded a p-value of 0.0004. Then, across indicators, we multiplied this p-value by 6 for the six indicators, yielding a p-value of 0.0024. This p-value is very conservative because it

ignores correlations across indicators that would reduce the multiplication factor below 6 and assumes a perfect correlation between tests within the indicators that would add additional confidence based on rejection for multiple outcomes, in this case a rejection for test scale scores as well at the 0.05 p-value.

The next high level of confidence arises for *online access in spring 2020*. We conducted the same exercise multiplying the lowest p-value by 4, and then multiplying the resulting p-value by 5 given the 5 remaining indicators, since the null hypothesis has already been rejected for the first indicator (following a step-down Bonferroni approach). The last indicator where we observed some statistical evidence of a relationship is *assessment rigor*. In this case, we note that we have very similar p-values for both attendance rate and chronic absence. Even if these tests were perfectly correlated, we could conclude that there are results for attendance overall with a maximum p-value of 0.027 and that we failed to find results for test scores overall. Therefore, we multiplied this p-value by 2 to capture the fact that we examined both attendance and test performance, and then multiplied the resulting p-value by 4 because there are only four district inventory indicators remaining after the null hypothesis has been rejected for the first two. These corrections yielded a p-value of 0.224 when using these very conservative approaches. Therefore, once the correlations between tests are considered, this p-value could fall considerably and meet reasonable threshold of confidence. However, at present, we will only discuss the results on this variable as suggestive of effects.

Next, we moved to the exploratory analyses described in our pre-analysis plan and examined the individual outcome and grade span estimates for each indicator. Table F22 starts by presenting the test scale score and test proficiency estimates for *social services referrals* and test proficiency for *online access in spring 2020* (the test scale score F-test is not significant for *online access*). We observe lower math test scale scores and proficiency levels across the board, especially in lower grades, with larger increases in resources for referrals and more student referrals relative to pre-pandemic levels; we also observe some evidence of higher ELA scores and proficiency for 6<sup>th</sup> grade. In terms of magnitude, a one-point increase in this five-point scale is associated with declines proficiency in math by 1 to 2.5 percentage points of students for 5th-8th grades (for example, the percentage of a district's fifth grade students proficient in math might fall from 50% to 48%). In terms of ELA proficiency, we observed declines of about one percentage point for 6th grade. Math and ELA test scale scores for the same grades decline by between 2.5 and 3.5 percent of a standard deviation.

Given that the *social service referrals* indicator (number of students referred for social services and resources allocated for social services referrals) is associated with lower test scores, it is important to discuss potential mechanisms behind these effects. Given the low correlation with student share high needs, we do not anticipate that these results are caused by pre-pandemic differences between districts. Rather, one possible explanation is a type of reverse causality where conditional on the pre-pandemic needs of students, the students in some districts faced larger shocks and were in much more need of referrals, leading to more resources allocated for making more referrals. These same schools saw substantially larger declines in test scores, especially math test scores, during the pandemic. A natural policy implication to draw from these results is that standard measures of district need and disadvantage (for example, those used to identify Alliance districts) may not fully capture the heterogeneous impacts of a crisis on a district's student body. Ongoing monitoring during a crisis may be required to identify districts where due to unforeseen circumstances learning losses are likely to be especially large.

The district inventory indicator with the second lowest p-value is *online access in spring 2020*. Only the F-test for test proficiency is highly significant. However, like assessment models, we have two results for attendance rate and chronic absence that are near significant at the five percent level. Starting with proficiency in column 3 of Table 22, we observe that most of the estimates are positive, but only two are statistically significant: 6<sup>th</sup> grade proficiency in math and 11<sup>th</sup> grade proficiency in ELA using the state established proficiency threshold for the SAT test each year. In terms of magnitude, a 20% increase in the percentage of students with online access (equivalent to a one standard deviation increase) implies a 1.5 percentage point increase in the share of 6<sup>th</sup> grade students proficient in Math in the spring of 2021 and a 1 percentage point increase in the share of 11<sup>th</sup> grade and subject matter affected, one might reasonably conclude that there are test score effects, but they are sufficiently small that one can only detect effects when estimation errors lead to large magnitude estimates and one cannot reliably determine whether these estimated effects are concentrated in a specific grade or in a specific topic area.

Finally, Table F23 presents attendance effect estimates for both *online access* and *assessment rigor*. For online access, chronic absence and attendance effects are unexpectedly negative with better access in spring 2020 being associated with worse attendance in 2020-21, but the estimates are quite small, less than 0.002 in terms of attendance rates and at most just over ½ a percentage point in terms of rates of chronic absence in 2020-21. These effects may arise simply because good online access in spring 2020 is consistent with better ability to manage hybrid and online learning in 2020-21 and therefore may have led to better tracking of student attendance.

More rigorous student assessment practices are also associated with differences in attendance and chronic absence during the pandemic. In this case, more rigorous assessment is associated with better attendance in middle school, but the effects are small in magnitude. A 1-point improvement in the 6-point assessment index has effects of less than 0.002 in terms of increasing attendance rates and only  $\frac{1}{2}$  of one percentage point reduction in chronic absence.

	Remote learning conditions (i.e. district inventory indicators)							
	Synchronous Spring 2020	Online Access Spring 2020	Summer Preparation	Assessment Rigor 2020-2021	Social Services Referrals	Improvements in Online Learning		
Mean	0.747	74.8	8.51	5.38	3.92	5.67		
Min/Max	0/1	20/100	2/10	0/6	1/5	1/7		
Correlations with								
Days In Person Sept-June	0.17	0.34	-0.24	0.05	-0.03	-0.18		
Days In Person Sept-April	0.19	0.31	-0.22	0.06	-0.03	-0.18		
Share High Need	-0.15	-0.60	0.09	-0.03	+0.13	0.35		
Outcomes in 2020-21	F-Test [p-value]	F-Test [p-value]	F-Test [p-value]	F-Test [p-value]	F-Test [p-value]	F-Test [p-value]		
Attendance Rate	1.31 [0.265]	2.39 [0.058]	0.17 [0.956]	2.59 [0.036]	1.36 [0.244]	1.75 [0.138]		
w/ in outcome Bonferroni								
Chronic Absence	2.04 [0.086]	2.34 [0.053]	0.76 [0.552]	2.75 [0.027]	0.68 [0.609]	2.29 [0.058]		
w/ in outcome Bonferroni				[0.054]#				
Scale Score	1.30 [0.228]	1.30 [0.225]	1.12 [0.340]	0.89 [0.541]	2.27 [0.0128]	1.28 [0.238]		
w/ in outcome Bonferroni					[0.0512]			
Proficiency	0.98 [0.458]	2.77 [0.0023]	0.99 [0.453]	1.46 [0.148]	3.64 [0.0001]	0.75 [0.682]		
w/ in outcome Bonferroni		[0.0092]			[0.0004]			
Treatment Bonferroni 6								
tests using most significant	X	[0.046]	X	[0.224]#	[0.0024]	X		
outcome								

#### Table F21. Results of Inferential Analysis: Association of Remote Learning Conditions with Student Outcomes

Notes: Difference-in-Difference models estimated with pooled grades and/or grade spans and school fixed effects. Models for *online access spring 2020* are estimated interacting a propensity score for the district inventory item with a pandemic dummy due to the high correlation of the item with school share of students with high needs. Similarly, the model for *improvements in online learning* are estimated using inverse propensity score weights associated with the scores on the district item. F-tests conducted for significant of all estimates across grades/grade spans. Within outcome Bonferroni conducted by multiplying p-value of most significant result by four with the exception of *assessment rigor* where combined results for Chronic Absence and Attendance are compared to overall results for test score variables by multiplying lowest p-value by two and conservatively assuming perfect correlation between estimates for Attendance Rate and Chronic Absence. The last row shows the combined Bonferroni significance level across the six tests using a step-down approach multiplying the p-value for the item with the lowest p-value by six for the six items considered, the next by five, etc. An X in this row implies that estimates are far from any reasonable significance level.

	Social Serv	Social Services Referrals					
Outcomes	Test Scores	<b>Test Proficiency</b>	<b>Test Proficiency</b>				
Math 5th Grade	-0.0339***	-0.0248***	0.0069				
	(0.0123)	(0.00593)	(0.0339)				
Math 6th Grade	-0.0256**	-0.0232***	0.0723***				
	(0.0106)	(0.00530)	(0.0276)				
Math 7th Grade	-0.0367***	-0.0137***	0.0211				
	(0.0107)	(0.00489)	(0.0267)				
Math 8th Grade	-0.0243*	-0.0172**	-0.0454				
	(0.0134)	(0.00679)	(0.0419)				
Math 11th Grade	-0.0062	0.00301	0.0054				
	(0.0121)	(0.00525)	(0.0307)				
ELA 5th Grade	-0.0134	-0.0057	0.0377				
	(0.00912)	(0.00423)	(0.0231)				
ELA 6th Grade	-0.0254**	-0.0117**	0.0054				
	(0.0106)	(0.00473)	(0.0304)				
ELA 7th Grade	-0.0154	-0.0085	0.0175				
	(0.0118)	(0.00535)	(0.0254)				
ELA 8th Grade	-0.0149	-0.0075	0.0361				
	(0.0118)	(0.00480)	(0.0257)				
ELA 11th Grade	-0.0060	-0.0062	0.0499*				
	(0.0111)	(0.00531)	(0.0302)				

#### Table F22. Individual test and grade estimates for remote learning conditions

Remote learning conditions (i.e. district inventory indicators)

Notes: Each column represents the estimates on the interaction between the district inventory indicator and dummy variables for each student test subject and grade. The first row of column headers indicate the district inventory indicator and the second row indicates the student outcome.

	Online Acces	s Spring 2020	Assessment Models 2020-2021			
Outcomes	Attendance Rate	<b>Chronic Absence</b>	Attendance Rate	Chronic Absence		
Early Elementary	-0.00733**	0.0319**	0.000173	0.00143		
	(0.00318)	(0.0132)	(0.000458)	(0.00286)		
Late Elementary	-0.00713***	0.0178**	-8.75e-05	0.00259**		
	(0.00247)	(0.00815)	(0.000298)	(0.00127)		
Middle School	0.00222	0.0162	0.00158***	-0.00496**		
	(0.00277)	(0.0136)	(0.000507)	(0.00219)		
High School	0.00102	-0.00345	0.000224	0.00278		
	(0.00538)	(0.0141)	(0.000826)	(0.00238)		

#### Table F23. Individual grade span attendance estimates for remote learning conditions

Remote learning conditions (i.e. district inventory indicators)

Notes: Each column represents the estimates on the interaction between the district inventory indicator and dummy variables for each grade span. The first row of column headers indicate the district inventory indicator and the second row indicates the student outcome.



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