



“Changing our teaching”: first grade reading instruction and before and during COVID-19

Paola Pilonieta¹ · Colleen E. Whittingham¹ · Erin K. Washburn¹

Accepted: 28 February 2023 / Published online: 18 March 2023
© The Author(s), under exclusive licence to Springer Nature B.V. 2023

Abstract

By April 2020 public schools throughout the country closed due to the COVID-19 pandemic. On the brink of these turbulent times, we concluded a larger survey study describing first grade literacy instruction in February 2020. Having documented a year of pre-pandemic literacy instruction, we then reached out to the same participants to report on their experiences teaching first grade during the 2020–2021 academic year impacted by COVID-19. In this exploratory study we surveyed first grade teachers ($n=36$) to better understand the context, the amount of time allocated, and the materials and resources used by teachers for and during literacy instruction and how these variables differed before and during the COVID 19 pandemic. Our data indicated teachers had increased responsibility as they had reduced access to collaborative planning ($t_{35} = -2.092$, $p = .004$, $d = -0.507$), and the support of paraprofessionals ($t_{35} = -2.256$, $p = .030$, $d = 0.457$). This increase in responsibility was amplified by the challenges of virtual and hybrid instruction, and the changes in instructional formats experienced by teachers. Concurrently, students experienced less instructional time ($Z_{35} = -3.704$, $p < .001$, $r = -0.437$), particularly in the areas of writing, vocabulary, and fluency. The consequences of these tumultuous experiences for teachers and students are likely to be long-lasting and complex to reconcile.

Keywords First-grade literacy · Early literacy · COVID-19 · Curriculum

Introduction

By April 2020 public schools had closed in all fifty states due to the COVID-19 pandemic (Marshall et al., 2020). Seemingly overnight, teachers transitioned to virtual instruction with little online teaching preparation (Middleton, 2020). Primary students, accustomed

✉ Paola Pilonieta
pilonieta@uncc.edu

¹ Reading and Elementary Education, University of North Carolina at Charlotte, 9201 University City Blvd., Charlotte, NC 28223, USA

to hands-on learning and often not yet independent readers, experienced perhaps the most jarring shift in instruction, lingering well into the following school year. On the brink of these tumultuous times, we concluded a larger survey study describing first grade literacy instruction in February 2020. Having documented a year of pre-pandemic instruction for this initial study, we realized we were uniquely positioned to be able to compare instruction before and during the pandemic. In the spring of 2021, we revised our survey instrument (CCQ→CCQ2) in order to provide a snapshot of first-grade literacy instruction during the pandemic. We then contacted the same participants to request they report on their experiences teaching first grade during the 2020–2021 academic year impacted by COVID-19. We did not have specific hypotheses as to what instruction during the pandemic would look like; we only knew from our experience working with schools and supporting our own children through their schooling that instruction—whether virtual, or face-to-face wearing masks and observing social distance—would be different, and these differences would likely have consequences. Our goal was to capture a description of first grade literacy instruction in the hopes of providing context for, what at the time of the conception of this study, were unknown consequences.

As such, this study provides a state-wide account of literacy instruction in first grade in North Carolina, from the teachers' perspective. This study describes instruction during the literacy block and the curricular materials used in first grade classrooms in one southeastern state during the 2020–2021 COVID-19 pandemic school year and compares these experiences to those during pre-pandemic instruction using data collected in 2019–2020. We sought to answer the following research questions from teachers' reports about the context of literacy instruction, time allocated to literacy instruction, and the materials and resources used for literacy instruction:

1. What is the context of literacy instruction in regard to class size, learner profiles, instructional planning supports, professional development, and resource personnel during the 2019–2020 and 2020–2021 school years, and to what extent, if any, do they differ? What instructional delivery method do first grade teachers report using for literacy instruction the 2020–2021 school year?
2. How much time do first grade teachers self-report allocating to literacy instruction during the 2019–2020 and 2020–2021 school years? To what extent, if any, does the time allocated to literacy instruction differ?
3. What literacy instructional materials do first grade teachers report using during the 2019–2020 and in the 2020–2021 school years? To what extent, if any, do first grade teachers' use of instructional materials change in response to the Covid-19 pandemic? In what ways, did teachers report change in use of materials and instructional techniques in response to the Covid-19 pandemic?

Review of the literature

Instructional time

The type and amount of reading instruction both play important roles (Spear-Swerling & Zibulsky, 2014). A 90-min block of protected, uninterrupted literacy

instruction each day has been a common educational recommendation since the Reading First era (Underwood, 2018). Though there are currently no research-based suggestions specifying how much instructional time should be devoted to each literacy component, the amount of instructional time allocated to each component should vary by grade level (Spear-Swerling & Zibulsky, 2014). For example, phonemic awareness and phonics should be allotted more instructional time in kindergarten and first grade than in fourth or fifth grade.

Duke et al. (2016) reported effective teachers crafted high-energy, quick paced lessons and thoughtfully used instructional time. Unfortunately, when allocating instructional time across literacy components, Cunningham et al. (2009) found teachers' proposed allotment of instructional time was inconsistent with research-based recommendations. As an example, they highlight first grade teachers devoting less than five daily minutes on average to phonemic awareness instruction despite the key role phonemic awareness plays in the development of early reading skills. It can be problematic when literacy components fundamental to particular grade levels receive minimal attention or are skipped entirely (Spear-Swerling & Zibulsky, 2014).

Curriculum

Teacher knowledge, instructional time, and curriculum all influence students' reading outcomes. Though research indicates "it is the quality of the individual teacher's practices, more than the specific materials or general approach the teacher uses, that influences students' reading growth," (Duke et al., 2016, p. 35) reading curricula does play an important role. Curricula should be planned, intentional, and explicit programs that teach specific skills (Hattie, 2009). Crowe et al. (2009) found that well-designed, research-based core reading curricula can sustain and raise students' reading achievement.

Reading curricula should include explicit, systematic instruction in the five central components of reading: phonemic awareness, phonics, fluency, vocabulary, and comprehension as well writing (National Reading Panel, 2000; Spear-Swerling & Zibulsky, 2014). Curricula can also assist in circumventing content/time allocation issues raised by Cunningham et al. (2009) and ensure all areas of reading are included in instruction. In fact, Spear-Swerling and Zibulsky's (2014) research indicates without comprehensive curricula, many educators might not teach the key components of reading and writing instruction. They also suggest appropriate curricula and guidance from districts can help avoid instructional inconsistencies across teachers that could lead to problems for children's literacy achievement and undermine school-wide initiatives. Together, a research-based core literacy curriculum along with a knowledgeable teacher can provide the foundation for effective literacy instruction (Crowe et al., 2009).

Teacher knowledge

While using a comprehensive core curriculum contributes to student achievement and can assist teachers in addressing all components of literacy, student differences

and limitations of the curriculum itself require teachers to access extensive content knowledge in order to positively impact students' literacy outcomes (Moats, 2009). Teachers need to possess specialized knowledge understanding the progression of literacy skills and how instruction in phonological awareness, phonics, fluency, vocabulary, and comprehension contribute to proficient reading, specifically during first grade (Piasta et al, 2009). Teachers must also recognize the role of oral language development in later reading achievement (Kendeou et al., 2009; Lervåg et al., 2018).

Similarly, Duke et al. (2016) notes teachers have “a considerable impact on student growth” (p. 35). In a study examining different models of school-wide literacy instruction reform, researchers found that apart from student ability, the biggest source of variability in first grade reading outcomes was the pedagogical skills of the teachers (Tivnan & Hemphill, 2005). After examining research on teachers identified as exemplary literacy educators, Duke et al. (2016) identified a set of practices used by these teachers. Relevant to this study are practices that indicate effective teachers:

- are intentional, meaning instructional decisions are made carefully and skills and strategies are explicitly connected to reading and writing.
- thoughtfully create a classroom environment that engages and motivates students and clearly communicates classroom routines.
- use time wisely and maximize learning through on-task behavior.
- “orchestrate” (p. 42), or integrate, a variety of instructional, curricular, and managerial practices to seamlessly provide literacy instruction.

Along with these practices, teachers who can identify students' needs and can tailor their instruction to match those needs, are more effective, and have stronger student outcomes (Moats, 2009). As schools transitioned to remote instruction early in the pandemic, many teachers had little guidance on how to provide literacy instruction in a virtual environment. Teachers would be called upon to use their content knowledge to navigate instruction in the coming months of remote instruction.

Instructional inconsistencies due to the COVID-19 pandemic

Implementing research-based instructional approaches using corresponding curricular materials can be challenging under the best of circumstances, let alone during a worldwide pandemic. The RAND Corporation reported information from principals, teachers, and school websites indicating considerable inconsistencies in schools' curricula during pandemic instruction (Diliberti et al., 2020). A primary source of inconsistency was the medium of instruction, with about 60% of K-12 students starting the 2020–2021 academic year via remote instruction, 20% starting with a hybrid of remote and in-person instruction, and about 20% starting the school year solely in-person (Dorn et al., 2020a). Students living in or near poverty were more likely than students from higher-income families to start the year remotely (Olneck-Brown, 2021) and students of color were significantly more likely to remain remote through

the fall of 2020. This is concerning, as online instruction does not provide the same academic results as in-person instruction (Dorn et al., 2020a).

Variety within online instructional approaches results in varying degrees of instructional quality (Bushweller, 2020). Middleton (2020) documented variability even within schools and grade levels, with grade-alike teachers approaching content in vastly different ways—some reflecting narrowed learning opportunities and others demonstrating high degrees of innovation. Variability in access to rigorous, high-quality instruction during the pandemic was coupled with limited access to new content, and limited opportunities for teacher feedback on, and student accountability for, new material, all of which negatively impacted student learning (Middleton, 2020).

Compounding differences in the mode and content of instruction were personal factors impacting teachers while they learned to deliver instruction remotely. Many teachers were responsible for additional family members or for their own children's remote learning while simultaneously delivering instruction online. Some lacked high-speed internet connections making remote instruction even more challenging (Bushweller, 2020).

Widening learning inequities: *the COVID slide*

Towards the end of the 2020, teachers, parents, and school leaders anxiously awaited testing data that would indicate how much learning students had lost. NWEA published third through eighth grade reading MAP scores from Fall 2020. Data did not reflect the anticipated decline, as grade 3–8 reading scores were similar to those from Fall 2019 (Kuhfeld et al., 2020a).

However, Winter 2021 data published by Curriculum Associates (2021)—the publishers of the *i-Ready Diagnostic* assessment administered to almost 25% of children in the U.S.—reported lower scores in reading and math, particularly in grades 1–3, than historical averages. Similarly, the DIBELS midyear report indicated almost half of K–1 students scored within the lowest category in early literacy skills, nearly two-thirds more than before the pandemic (Guidry et al., 2021). The interruptions in learning (due to delays in universal access to wi-fi), the switch to remote instruction (the social emotional implications of which are still undetermined, but evident), and even in-person instruction with masks (which hinder the ability to watch teachers' mouth shape and movement) may negatively impact young learners more.

Reduced opportunities for learning are particularly worrisome in the early grades and are not equitable across student groups. Students from low-income families may be more adversely impacted as they often have less access to high-quality remote instruction, reliable internet, academic supervision, or a learning environment conducive to learning (Dorn et al., 2020b; Kuhfeld et al., 2020a; Middleton, 2020). An analysis of DIBELS scores from 400,000 students across 41 states shows twice as many African American kindergarten students at risk of not learning to read when compared to pre-pandemic numbers (Guidry et al., 2021). In fact, Kuhfeld et al. (2020a) predict students started the 2020 school year substantially behind and may need as much as two years to recoup lost learning.

Methods

This is an exploratory, descriptive study where changes in first grade teachers' use of literacy instructional materials in response to the COVID-19 pandemic are reported through statistical comparisons and a content analysis of open-ended survey responses. This study consisted of two phases. In Phase 1 of the study, during the 2019–2020 school year, we recruited all first-grade teachers in Title 1 elementary schools across one state to better understand their literacy instruction. One-hundred and four teachers participated in Phase 1, with representation from all eight of the states' instructional regions. Table 1 provides demographic information as well information regarding route to certification, total years teaching, and number of years teaching first grade.

At the beginning of the study teachers completed a Classroom Context Questionnaire (CCQ) to describe their classroom demographics, professional development, and the instructional materials they used to teach literacy. Teachers then completed Literacy Logs (LL) for 15 consecutive days in the fall of 2019 and again in the spring of 2020 documenting their literacy instruction (see Pilonieta et al., 2020 for a report of the LL data).

For Phase 2 of the study, researchers contacted Phase 1 participants in April 2021 inviting them to complete a revised CCQ (CCQ2). All Phase 1 participants who completed the majority of Phase 1 study-related activities were eligible to participate in Phase 2 ($n=79$). Forty-seven teachers responded to our invitation. Only teachers who continued teaching in first grade were included in the dataset, resulting in 36 valid and complete responses. All eight of the state's instructional regions were again represented.

Table 1 provides demographic information for Phase 2 participants as well. There is no notable difference between the groups. While the state does not provide teacher demographic information disaggregated by grade level taught, this sample size is fairly representative of the North Carolina teaching force in terms of race data from 2017–2018 (the most recent year recorded), which is 77% white, 14% Black, 4% Hispanic/Latina, less than 1% Native American/American Indian, with no option to report multiracial identity (National Center for Educational Statistics, 2022).

Comparative analysis was then conducted based on Phase 1 and Phase 2 data generated by the 36 participants who completed both phases of the study. No Phase 1 data without a comparative data point was used in the analysis presented here.

Instrumentation and survey distribution

Participants completed the CCQ for both phases of the study. The initial CCQ survey was developed and field-tested by the authors and asked questions about the teachers' personal demographics as well as the classroom's demographic context. Teachers were asked to describe their literacy block, with specific questions focusing on small group instruction and curricular materials used. Teachers were also asked to describe the support they had with regard to an instructional assistant,

Table 1 Participant demographics and experience

Participants' self-reported racial identities					
	Statewide*	Year 1 only (n = 104)		Year 1 and Year 2 (n = 36)	
	%	n	%	n	%
White	77	88	84.6	33	91.7
Black	14	6	5.8	2	5.6
Hispanic/Latinx	4	3	2.9	0	0.0
Native American/American Indian	< 1	2	1.9	1	2.8
Multiracial	NR	3	2.9	0	0.0
Declined to respond	NR	2	1.9	0	0.0
Participating teacher certification and years teaching					
		Year 1 Only (n = 104)		Year 1 & Year 2 (n = 36)	
		n	%	n	%
<i>Certification route</i>					
Undergraduate degree		80	76.9	28	77.8
Graduate certificate		12	11.5	5	13.8
Alternative licensure		7	6.7	2	5.6
Other		5	4.8	1	2.8
<i>Number of years teaching</i>					
First year teaching		–	–	–	–
2–3 years		11	10.6	3	8.3
4–6 years		16	15.4	5	13.9
7–10 years		14	13.5	4	11.1
11–15 years		25	24.0	10	27.8
16–20 years		20	19.2	8	22.2
21 + years		18	17.3	6	16.7
<i>Number of years teaching first grade</i>					
First year teaching		7	6.7	3	8.3
2–3 years		30	28.8	9	25
4–6 years		30	28.8	10	27.8
7–10 years		14	13.5	4	11.1
11–15 years		10	9.6	5	13.9
16–20 years		10	9.6	3	8.3
21 + years		3	2.9	2	5.6

*Statewide data reports the 2017–2018 teaching force, the most current year available. All racial categories in the CCQ reflect those categories used by the state, with the addition of a 'decline to respond' option

literacy coach, and professional development. Author 1 developed the first draft of the CCQ, attempting to consider all the factors that influence classroom instruction. Author 2 reviewed and revised the items, before the CCQ was shared with the graduate research assistant assigned to the project and their feedback was incorporated. Next, the CCQ was shared with two colleagues, an early literacy content expert and an expert in teacher education and professional development. Both provided detailed feedback to further refine the questions before the survey was entered into the Qualtrics software. Members of the research team completed the survey 2–4 times, considering various scenarios, to assure accurate skip- and display-logic were in place before dissemination to participants.

Phase 2 required a revision to the CCQ (CCQ2) to assure both parallel and novel information unique to instruction during a pandemic were gathered. Author 1 initiated the revisions, attempting to consider all facets influencing instruction that may have been altered in the past year. Author 2 reviewed and revised the items before the CCQ2 was shared with two non-participant first-grade teachers and their feedback was incorporated. Next, the CCQ2 was entered into the Qualtrics software. Members of the research team and an additional non-participant first grade teacher completed the survey to ensure skip- and display-logic accuracy before dissemination to participants. Appendix contains a copy of the CCQ2.

After revising the CCQ2, participants received a recruitment email in mid-April of 2021. Teachers received two emails requesting their participation and reminding them to complete the survey.

Analysis

Below we describe how each research question was analyzed. We use the shorthand RQ1, RQ2, and RQ3 to indicate the research question being discussed.

To compare the context of literacy instruction during the 2019–2020 and 2020–2021 school years (RQ1), we calculated descriptive statistics to examine classroom context factors (class size, learner profiles, instructional planning supports and resource personnel). To test for any classroom context differences between the two school years, we conducted a series of comparative analyses. Specifically, paired samples t-tests were calculated for pre-pandemic instruction (Phase 1) and post-pandemic instruction (Phase 2) classroom context factors that met t-test assumptions. For factors that did not meet these assumptions, a Wilcoxon sign-rank test was calculated. To decrease the likelihood of Type I error, the Bonferroni correction was applied when calculating the series of paired samples t-tests and the series of Wilcoxon sign-rank tests. Effect sizes were calculated using Cohen's *d*, adjusted for correlations between pre and posttest scores, for t-test effects and Mann–Whitney *U* for Wilcoxon signed-rank tests.

To compare time allocated to literacy instruction during the 2019–2020 and 2020–2021 school years (RQ2), we first calculated descriptive statistics to examine the amount of time teachers self-reported for literacy instruction. Next to test for differences between the reported time allocated for literacy instruction in the

2019–2020 and the 2020–2021 school years, we conducted a Wilcoxon sign-rank test between the number of each time category.

To compare literacy instructional materials used by first grade teachers during the 2019–2020 and 2020–2021 school years (RQ3), we first calculated frequency counts of individual programs and then collapsed individual programs into broader curricular categories. This collapsing of broader categories allowed us to analyze comparable programs. For example, a comprehensive curriculum (i.e., basal), such as Expeditionary Learning (EL), is used as core daily instruction for teaching all literacy skills and could not be compared to a Commercial Component Specific curriculum, such as Heggerty Phonemic Awareness, that is designed to target instruction on a specific literacy skill(s). Table 2 provides a description and examples of each category. To test for differences between teacher reported use of instructional materials and resources before and in response to the pandemic, we calculated a series of comparative statistics. Paired samples t-tests were calculated for pre and post classroom context factors that met t-test assumptions. For factors that did not meet these assumptions, a Wilcoxon sign-rank test was calculated. To decrease the likelihood of Type I error, the Bonferroni correction was applied when calculating the series of paired samples t-tests and the series of Wilcoxon sign-rank tests. We calculated Cohen's *d* effect sizes, adjusted for correlations between pre and posttest scores, for t-test effects and Mann–Whitney *U* effect sizes for Wilcoxon signed-rank tests.

The CCQ2 also included six open-ended questions (see Appendix), four of which were analyzed for this paper (see Table 3) as part of RQ1 and RQ3. Two questions were excluded because they were beyond the focus of the current research study. Specifically, the two questions omitted were: (a) a question in which teachers were asked to describe the structure of their literacy instruction block (e.g., a typical day of literacy instruction) and (b) a question in which teachers were asked to share observed differences between their first grade classrooms in 2020 and 2021. These questions in Table 3 were analyzed independently by Author 1 using content analysis (Neuendorf, 2016). Survey responses were read multiple times to identify key words in the teachers' responses to the open-ended questions. Codes were then developed based on these keywords; similar codes were clustered together to develop categories. After initial coding was completed, Author 1 once more reviewed the data renaming or collapsing codes initially established into other codes or categories.

For example, when asked about their biggest academic difference between students from the 2019–2020 and 2020–2021 academic years a response such as "Students this year [2020–2021] are lacking the base knowledge and skills in reading and math they receive in kindergarten," was coded as academically behind. Less independent, lower academic stamina, hard to engage virtually, lack of parental involvement, and too much parental involvement were all codes used for responses to this question. Teacher responses could also be double coded. "The students do not have much work stamina. They also want a lot more [one-on-one] help than ever before," was coded as less stamina and less independent. Table 3 details the codes for each question and provides an example of a teacher's response.

Author 2 then reviewed the data with the accompanying codebook for consistency and agreement. Any differences were resolved until 100% agreement was reached. Percentages were then calculated to determine the number of participants

Table 2 Description of curricular categories

Category	Source	Content Coverage	Professional Development	Examples
Commercial Comprehensive (Basal)	Created by a publisher and purchased through the publisher	Covers all 5 components of literacy	Requires some professional development to implement effectively	Harcourt Core Knowledge Reading Street
Commercial Component Specific Curriculum	Created by a publisher and purchased through the publisher	Covers a specific component(s) of literacy	Requires some professional development to implement effectively	Letland Fundations Words Their Way
Commercial Supplemental	Created by a publisher and purchased through the publisher	Used to support student practice of one or more component(s) of literacy	Professional development may or may not be required to implement effectively	Reading A to Z Leveled book kits iStation
Teacher Created	Created by a teacher or groups of teachers and made available for distribution (free or for purchase)	Covers one or more components of literacy	No professional development necessary	Teachers Pay Teachers Pinterest Creating own materials
Instructional Frameworks	Created by an educator or researcher and purchased through publisher	Covers one or more components of literacy with a distinct approach or process	Professional development may or may not be required to implement effectively	Guided Reading Daily 5 Reading Essentials

Instructional frameworks are sets of routines that provide a structure for how teachers can teach several literacy components in a lesson

Table 3 Codes for open-ended questions

Open-ended survey question	Codes emerging from data	Sample teacher response
<p>What has been your greatest professional challenge in teaching this year? (RQ1)</p>	<p>Schedule changes, teaching face-to-face & remote, COVID safety protocols, less instructional time, too much/too little parent involvement, students academically behind, zoom engagement, technology issues, teaching virtually, learning new technology</p>	<p>"It has been a challenge to get students to get on Zoom, as some said they did not have internet access. I would get them internet access, yet some just would not get on. It has also been a challenge because much of the submitted work is written by parents."</p>
<p>What is the most effective teaching technique you are using during virtual instruction? If you are not teaching virtually, write NA (RQ3)</p>	<p>Grouping, using online resources, short zoom sessions, having kids write, using visuals, games</p>	<p>"Having the kids Zoom in for very short, targeted lessons and then giving them assignments in Seesaw to practice what they learned. The 1:1 reading and writing conferences were effective."</p>
<p>What are the biggest academic differences you have observed when comparing this year's students to those you taught in 20-21? (RQ1)</p>	<p>Academically behind, less independent, lower stamina, lack of parent involvement, too much parent involvement, hard to engage virtually</p>	<p>"Their reading and math scores are just much lower. You could tell they missed months of schooling. I had previously been a kindergarten teacher, so I understood the K teachers when they said their students missed the time in year when the lightbulbs clicked"</p>
<p>What are the biggest social and/or emotional differences you have observed when comparing this year's students to those you taught in 20-21? (RQ1)</p>	<p>Less independent, less mature, need more validation, poorer social skills, less motivated, less stamina, seeks social interaction, resilient, focus more on feelings, none</p>	<p>"Again, my students are not as independent, they require more support when it comes to how to play and interact with others. It has been interesting."</p>

who responded similarly. Content analysis data was used to further contextualize and provide specific examples of quantitative data.

Results

Below we describe the literacy block and the curricular materials used in first grade classrooms during the before the pandemic during the 2019–2020 school year and compare these experiences to those during 2020–2021 COVID-19 pandemic school year. To answer our aforementioned research questions, we describe first grade teachers' context of literacy instruction (RQ1), time allocated to literacy instruction (RQ2), and the materials and resources used for literacy instruction (RQ3).

Context of literacy instruction

Table 4 provides means, standard deviations, paired samples or Wilcoxon sign-rank values, and effect sizes for class size, student learner profiles, and types of instructional supports and personnel.

Class size

Class size for the 2020–2021 school year ranged from 8 to 30 students, with 17 students as the average. Comparatively, during the previous school year class sizes ranged from 13 to 18 students, with 18 as the average class size. However, on average, class size did not differ between the two school years.

Learner profiles

In Table 4, an overview of students' learner profiles is shared. During both academic years teachers had an average of two students with IEPs, and one student qualifying for ESL services. Moreover, teachers reported a similar number of students receiving additional reading instruction through Tier 2 and Tier 3 instruction in both school years. Thus, the number of students receiving additional tiered support did not significantly differ between the two school years. Teachers overwhelmingly (78%) reported students "being behind" as the biggest academic challenge while teaching during the pandemic.

In addition to the learner profile information reported in Table 4, the CCQ2 collected teacher perceptions about their students' emotional wellbeing. Eighty-six percent of teachers reported significant social/emotional differences when considering 2020–2021 students as compared to those from the previous school year. Almost half (47%) of teachers described students as less independent, more immature, and generally more "needy" than previous students. One teacher stated, "Students have become much more 'needy'... they want to make sure they are doing each part of their work correctly." Teachers (25%) reported students as less motivated and with less stamina for schoolwork. One teacher noted, "students lack stamina... students

Table 4 Context of literacy instruction

	2019–2020 school year		2020–2021 school year		T value	ES
	M (SD)	M (SD)	M (SD)	M (SD)		
Class size						
Number of students in class ^a	16.94 (3.56)	17.25 (3.77)			-.377	-
<i>Student learner profiles</i>						
Number of students requiring additional services (IEP, ESL) ^a	3.31 (2.22)	3.06 (2.11)			.644 ^c	-
Number of students reading at benchmark ^b	7.97 (3.32)	6.89 (3.46)			1.659 ^c	-
Number of students reading below benchmark ^b	9.54 (3.79)	9.91 (4.03)			-.452	-
Students receiving Tier 2 or 3 services ^b	6.60 (4.33)	5.97 (4.17)			.696	-
<i>Types of instructional supports and personnel</i>						
Mean percent reported use of instructional pacing guides ^a	.67 (.478)	.67 (.478)			.000 ^c	-
Mean percent reported use of grade level planning structure ^a	.81 (.401)	.58 (.500)			-2.092 [*]	$d = -0.507$
Mean percent reported use of autonomy when planning ^a	.28 (.454)	.36 (.487)			-.828	-
Mean percent reported use of strong paraprofessional support (75–100% of time) ^a	.31 (.467)	.25 (.439)			.627	-
Mean percent reported use of some paraprofessional support (25–50% of time) ^a	.42 (.500)	.25 (.439)			1.435	-
Mean percent reported use of little/no paraprofessional support (0–24% of time) ^a	.28 (.454)	.50 (.507)			-2.256 ^{**}	$d = 0.457$
Mean percent reporting Tier 2 or Tier 3 instruction provided by classroom teacher ^a	.94 (.232)	.81 (.401)			-2.236 ^{c*}	$r = -0.264$
Mean percent reporting Tier 2 or Tier 3 instruction provided by someone other and/or in addition to the classroom teacher ^a	.81 (.401)	.67 (.478)			-1.667	-

* $p < .05$; ** $p < .01$

^aNumber of teachers who reported information (n = 36)

^bNumber of teachers who reported information (n = 35); ES effect size

^cWilcoxon Matched Pair Signed Rank Test

tire easily and often feel defeat quicker when a concept cannot be mastered quickly.” Teachers’ perceptions of students as “needy”, less motivated, and with less stamina for schoolwork could impact teachers’ ability to engage effectively in differentiated small group instruction, since students who are not with the teacher may not be relied on to complete literacy activities independently.

While 14% of teachers described students as eager to interact with their peers, they also commented on poorer social skills than students prior. Only 5% of teachers observed a positive difference, remarking, “My students have... been patient and resilient all throughout the year. I have loved seeing their growth as leaders and friends. They truly are there for one another.”

Instructional planning supports

Pre-pandemic, 28% teachers reported complete autonomy regarding instructional decision-making, as long as they addressed the state’s adopted grade level standards. Autonomy increased in 2020–2021, with 36% of participants now reporting full autonomy in instructional decision-making. Most teachers used school district created pacing guides (i.e., an instructional scope and sequence designed to help teachers know what to teach and when to teach it) to make instructional decisions or planned instruction in grade level-alike teams¹ (75% and 81%, respectively) before the pandemic. Teachers reported less use of grade level-alike collaborative efforts during pandemic teaching with 64% teachers relying on a pacing guide and 61% engaging in grade level-alike collaboration. Though teacher-reported autonomy when lesson planning and use of pacing guides between the two school years was not statistically significant, the decrease in the use of grade-level-alike planning structures¹ was significant ($t_{35} = -2.092$, $p = 0.004$, $d = -0.507$).

Professional development

Teachers in both phases of the study were asked to report their professional development experiences. In 2019–2020, all teachers reported participating in literacy-focused professional development (PD) in the prior three years with approximately 60% of teachers reporting engaging in more than 16 h of PD. Eighty percent of teachers indicated that literacy-related PD had impacted their practice. The topics receiving the most attention during PD were differentiating literacy instruction, comprehension, and reading fluency.

In 2020–2021, all but five teachers (those reporting only providing face-to-face instruction) engaged in PD to build capacity with virtual technologies, platforms, and strategies to deliver instruction. Twenty-four participants engaged in virtual technology PD, learning tools such as PearDeck or Padlet. Twenty-two teachers participated in virtual learning platform PD, focusing on tools such as Canvas or Blackboard. Virtual learning strategy PD was less related to tool use

¹ A grade level-alike team is a group of teachers that teach the same grade level (e.g., 1st grade) and collaborate on instructional decision making.

and more related to pedagogy, including ways to engage students in a digital context ($n = 18$).

More than three-fourths of the teachers who did engage in PD participated in school or district sponsored learning opportunities, and over half also sought new information through independent inquiry. Time spent on virtual learning PD ranged from less than two hours to more than six hours, with the largest percentage of teachers spending 2–4 h mastering virtual technologies (37.5%), virtual learning strategies (50%), and virtual learning platforms (59.1%) each.

Resource personnel used in first grade

Teachers also reported on their access to resource personnel in terms of who was responsible for Tier 2 and Tier 3 instruction (classroom teacher or other [i.e., interventionist, paraprofessional, other first grade teacher]) and the extent to which they have paraprofessional support in their classrooms (strong, some, little/no) (see Table 4). Before the pandemic, the majority of Tier 2 and Tier 3 instructional support was provided by the classroom teacher (94%), an interventionist or special education teacher (61%), a paraprofessional (38%), or a different first grade teacher (25%). Unsurprisingly, external personnel support decreased during pandemic instruction, with 14% fewer teachers receiving support from an interventionist and 14% fewer teachers receiving support from another first-grade teacher. Moreover, a significantly lower number of teachers reported Tier 2 and Tier 3 instructional support being provided by the classroom teacher ($Z_{35} = -2.236$, $p = 0.025$, $r = -0.264$).

In Table 4, we also share teacher-reported daily access to paraprofessional support. Pre-pandemic, 19% of teachers received instructional support from a paraprofessional during the entirety of their literacy block. Fifty-three percent of teachers reported having some support, and 28% reported little to no support. In fact, a significant difference in the amount of little to no paraprofessional support was found between the 2019–2020 and 2020–2021 school years ($t_{35} = -2.256$, $p = 0.030$, $d = 0.457$). Notably, there was also a decrease in the other categories of paraprofessional support (strong support and some support), though these were not statistically significant.

Instructional delivery methods during COVID

One-third of teachers reported face-to-face instruction as the primary instructional method. In contrast, 26% of teachers engaged in complete virtual instruction, and 33% of teachers experienced hybrid instruction, alternating between some face-to-face and some virtual instruction. Due to limited broadband internet in some areas 8% of teachers were unable to conduct “live” or synchronous virtual lessons. Instead, they recorded their lessons and posted them for students learning remotely.

At some point in the school year 64% of teachers reported being responsible for face-to-face *and* virtual students. Twenty-five percent of the sample reported

Table 5 Time allocated to literacy instruction

	2019–2020 school year (n = 35)	2020–2021 school year (n = 35)
	n (%)	n (%)
<i>Reported amount of time allocated to literacy instruction</i>		
< 60 min	1 (2.8)	14 (39.9)
61–90 min	5 (13.9)	11 (30.6)
91–120 min	22 (61.1)	6 (16.7)
> 120 min	8 (22.2)	5 (13.9)

this as their greatest professional challenge, noting the difficulty in “teaching both virtual and in-person students simultaneously. It’s been my hardest year of teaching to date, and I am so thankful for the years prior because I think if I didn’t have that I would have taken a break from teaching after this year.”

Ten different instructional delivery methods were reported, with the majority of teachers (80%) experiencing changes in instructional delivery format throughout the school year. Delivery format changes occurred as many as six times (for 10% of participants) or as few as one time (for 21% of participants), with most teachers experiencing two changes in delivery format at the time data collection ended (with approximately one month remaining in the academic year). It is therefore unsurprising that 31% of teachers reported schedule changes as their biggest challenge this year. One teacher described her greatest challenge as “going from fully remote, to Plan B [half the class attends face-to-face while the rest of the class is remote for a few days, then they switch], and back to fully remote, then back to Plan B, and now we are on Plan A [all students can attend face-to-face] (with 18 kids in person and 2 staying remote)... [changing] our way of teaching so many times.”

Time allocated to literacy instruction

Literacy instructional time

The state mandates 90-min of uninterrupted daily literacy instruction for K-3 students. Table 5 illustrates time allocated to literacy instruction during the 2019–2020 and 2020–2021 school years. During the 2019–2020 school year, only 3% of teachers reported spending less than 60 min engaged in literacy instruction and 14% spent close to the state mandate of 60–90 min. In 2020–2021 there was a notable increase in the amount of teachers spending less than the mandated 90-min of literacy instruction. Forty percent of teachers reported spending

Table 6 Primary instructional method used to teach literacy content

Content	Instructional method									
	Face to face		Face to face w/ remote learners		Syn-chronously		Asyn-chronously		Topic not taught this year	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Phonological awareness	15	42	7	19	11	30	2	6	1	3
Phonics	17	47	6	17	12	33	1	3	0	0
Fluency	16	44	4	11	10	28	4	11	2	6
Writing	18	50	4	11	9	25	4	11	1	3
Vocabulary	17	47	7	19	10	28	1	3	1	3
Comprehension	16	44	7	19	11	30	2	6	0	0

less than 60 min of combined synchronous and asynchronous daily instruction in literacy with a few of those teachers spending less than 30 min per day. Similarly, 31% of teachers approached the state requirement, reporting 61–90 min. In both academic years, there were teachers who exceeded the 90-min requirement, however more teachers reported exceeding the requirement before (22%) versus during (14%) the pandemic. Wilcoxon sign-rank tests revealed a significant difference in teacher reported amounts of time allocated to literacy instruction ($Z_{35} = -3.704, p < 0.001, r = -0.437$).

Synchronous and asynchronous instructional time during the pandemic

Literacy was taught synchronously five days a week by 50% of teachers, and four days by 31% of teachers. Forty-four percent of teachers taught literacy asynchronously one day a week. When considering the amount of asynchronous instruction, 47% of teachers developed activities they expected students to complete in less than 30 min. Synchronous literacy instruction lasted 31–60 min for 30% of teachers, and 61–90 min for 30% of teachers.

To better understand how the literacy block was structured, teachers were asked to indicate the instructional delivery method used for each literacy topic (Table 6). Most literacy content was taught face-to-face or synchronously. Except for two teachers, every teacher taught all areas of literacy to some degree. However, teachers reported spending less instructional time on writing, vocabulary, and fluency 32%, 20%, and 17% respectively this year.

Conversely, phonics and phonological awareness were identified as receiving *more* instructional time by 29% and 19% of teachers, respectively. Twenty-five percent of teachers indicated no literacy element of instruction received *additional* instruction when compared to last year whereas 14% of teachers reported no element received *less* instruction.

Instructional materials and resources used in literacy instruction

Literacy instructional materials and resources used in first grade

As illustrated in Table 2, instructional materials were grouped according to the material type (i.e., Commercial Comprehensive Curricula, Commercial Component Specific Curricula, Commercial Supplemental Curricula, Teacher Created Materials, Instructional Frameworks). We analyzed the mean number of materials and resources reported by teachers.

Analyses of specific curriculum listed by teachers indicated that teachers reported using less than one Commercial Comprehensive Curriculum in 2019–2020 (0.61) and in 2020–2021 (0.58) with no statistically significant difference between the two school years (see Table 7). Interestingly, two curricula were used by *more* teachers when compared to pre-COVID numbers: Core Knowledge was adopted by one additional teacher during the 2020–2021 school year, and Houghton Mifflin Harcourt was used by four additional teachers. One teacher whose school adopted a new curriculum described “finding additional time to learn new resources we were expected to teach with fidelity” as the biggest challenge during pandemic instruction.

Teachers, on average, reported using just a little more than one Commercial Component Specific Curricula with more during reported to be used in the 2019–2020 school year ($n=1.39$) than the 2020–2021 school year. However, the difference in the reported number used was not significant. Interestingly, Letterland, Foundations, and Horizons Phonics and Spelling were used by the same number of teachers with the same frequency from year to year (58%, 17%, and 6%, respectively).

Of all five types of curricula, teachers, on average, reported using a smaller number of Commercial Supplemental Curricula. Specifically, teachers reported using more Commercial Supplemental Curricula prior to the pandemic (0.33) than during the pandemic (0.17), but this difference was not significant. For example, the use of Reading A to Z decreased from 9 teachers pre-Covid to 5 teachers during pandemic instruction. Similarly, 77% of teachers reported daily use of leveled readers during classroom instruction in 2019–2020, whereas only 44% used leveled readers daily in 2020–2021.

In regard to Teacher Created Materials, on average teachers reported using more than one type of Teacher Created Materials in their literacy instruction. Specifically, in the 2019–2020 school year, teachers, on average, reported using 1.86 different types of Teacher Created Materials and 1.22 in the 2020–2021 school year. The difference between the two school years was statistically significant ($Z_{35} = -3.105$, $p = 0.002$, $r = -0.366$). For example, Pinterest, Teachers Pay Teachers, and “I create my own materials” were used by 22.2%, 19.4% and 16.7% less participants in 2020–2021 than in the previous school year, respectively.

Teachers, on average, reported using one Instructional Framework in the 2019–2020 school year (1.08) and less than one during the 2020–2021 school year (0.64). This was a statistically significant difference between the two school years with a decrease from before to during the pandemic in teacher use of Instructional Frameworks. For example, 8% less teachers who used the Jan Richardson guided reading materials pre-COVID continued to do so during pandemic teaching. Similarly, 25% less teachers who

Table 7 Instructional materials and resources used in literacy instruction

	2019–2020 School year		2020–2021 School year		T value	ES
	M (SD)	M (SD)	M (SD)	M (SD)		
<i>Mean number of materials and resources reported</i>						
Commercial comprehensive curricula	.61 (.803)	.58 (.770)			.167	–
Commercial component specific curricula	1.39 (.749)	1.17 (.665)			–1.057 ^a	–
Commercial supplemental curricula	.33 (.586)	.17 (.378)			1.641	–
Teacher created materials	1.86 (.931)	1.22 (.959)			–3.105 ^{ab*}	<i>r</i> = –0.366
Instructional frameworks	1.08 (.692)	.64 (.639)			–3.398 ^{ab***}	<i>r</i> = –0.400

All participating teacher provided responses to the above survey items regarding classroom context (n = 36)

ES Effect size

^aWilcoxon matched pair signed rank test

p* < .05, *p* < .01, ****p* < .001

used the Fountas and Pinnell guided reading materials pre-COVID continued to do so during the 2020–2021 school year. Of those continuing to use both programs, their frequency of implementation also decreased. For example, only 17% of teachers who reported using Fountas and Pinnell’s guided reading materials did so with the same frequency during 2020–2021 as they did in the previous year. Similarly, Jan Richardson’s guided reading instruction was used every day by 73% of users in 2019–2020, compared to only 58% of users in 2020–2021.

Instructional techniques used in first grade

Many of the pedagogical strategies teachers used before COVID-19 transferred readily to the virtual learning environment, as 75% of teachers identified at least one effective teaching technique useful to virtual instruction. For example, 28% of teachers continued to find working one-on-one and with small groups to be effective techniques during virtual learning. Teachers increased student engagement during pandemic instruction by using virtual and physical white boards, using additional visuals, and using games to make their lessons more interactive. Teachers also found online resources such as See-Saw or Google Slides, and the digital components of their existing curricular resources to be effective.

By contrast, in-person safety practices necessitated by COVID-19 protocols created instructional obstacles. These were reported by 61% of teachers as the greatest professional challenge of the academic year. Deep cleaning and sanitizing procedures further reduced instructional time and limited hands-on learning, while social distancing severely limited collaborative learning. Whereas 97% of teachers reported engaging in learning stations during the 2019–2020 academic year, only 83% did so during pandemic teaching. Mask-wearing presented additional communicative challenges, as teachers and students often heard only muffled versions of one another. One teacher stated, “masks have really hindered phonics and reading. It is hard to understand at times for students and myself.”

Discussion

In this exploratory study we surveyed first grade teachers to better understand their instructional literacy practices while teaching during the COVID 19 pandemic. As such, we add to the literature base on first grade literacy instruction studies in a unique way because our data was collected immediately prior to the pandemic. Specifically, the CCQ2 survey that we developed, piloted, and adapted through this study, describes the practices occurring within one state as they grappled with virtual and hybrid instruction, and provides in-depth details about literacy instruction that can provide some context to the current state of student reading achievement in one state. Though our findings are limited to one state and to a small sample size, parallels could be made to other school districts who implemented virtual and hybrid instruction. Ferren (2021) indicates 74 of the largest 100 school districts started the 2020–2021 school year with virtual instruction, a decision that impacted more than 9 million students. By May of

2021, while only 1% of school districts remained virtual, 46% were still offering hybrid instruction (Ferren, 2021).

Additionally, to the best of our knowledge, other studies of pandemic instruction have either captured a single teacher, school, or program's modification of a curricular practice to online instruction (e.g., Pilonieta et al., 2020; Stoetzel & Shedrow, 2021), documented the impact of COVID-19 on one specific student population (Crosson & Silverman, 2022), or offered a broad, national level view on reading achievement (e.g., Kuhfeld et al., 2020a; b). Ferren (2021) further explains national and state level data surrounding instruction during the pandemic is limited, as decisions regarding school reopening and instructional delivery were left to individual districts and schools. As such, our study fills an important gap in the literature as we sought to provide a more robust description of first grade literacy instruction, a grade critical for the reading development of young learners across multiple districts in one state during the pandemic.

Recently, the state in which this study was conducted released a report to better understand learning loss impact due to the pandemic (Office of Learning Recovery & Acceleration, 2022). This report is the first of its kind for this state, and one of the only available for any U.S. state at present. The report indicated students made less progress on average during the pandemic than they did in previous years. It also found a negative impact for all students, at all grade levels, in almost all subject areas. The report calls for education leaders and teachers to focus resources and interventions on early grade reading. Though our study does not intend to or identify the cause of this learning loss, it does provide information about what teachers reported using and doing for literacy instruction. Specifically, the context of literacy instruction, the amount of time allocated to literacy instruction, and the materials and resources used by teachers for and during literacy instruction and how these variables differed before and during the COVID 19 pandemic. This insight into teachers' use of materials and instructional time could help researchers, policy makers, and educators better understand some of the reasons that may have led to potential learning loss and missed instructional opportunities.

Context of literacy instruction

We found that teachers reported similar class sizes in both years with the average class size of 18 for 2019–2020 and 17 for 2020–2021. In terms of learner profiles, specifically those of student reading benchmark scores and the number of students receiving additional literacy instruction (e.g., Tier 2 or 3), we found no significant difference between the 2019–2020 and 2020–2021 school years, though teachers overwhelmingly reported students being academically behind. This set of findings is particularly interesting because of the national and global perception, as well as reported data (e.g., Kuhfeld et al., 2020b), that school aged children were significantly behind due to the pandemic. Similarly, teachers reported perceptions of students having more social and emotional challenges than in previous years.

In regard to instructional planning, teachers' use of pacing guides was exactly the same in both school years. Teacher autonomy increased in the 2020–2021 school year but not significantly. However, a significantly lower number of teachers reported having access to grade level-alike planning structures in the 2020–2021 school year than in 2019–2020. Given the variety in instructional delivery formats, it is also possible grade level-alike team planning was limited in situations where some staff members were assigned to full remote teaching and others to in-person. Notably, having more autonomy and less collaborative planning time may have contributed to teachers' feelings of isolation and stress as they navigated new styles of teaching and the challenges that came with it (Car-doza, 2021).

In addition, teachers reported having less access to daily paraprofessional support in the 2020–2021 school year than in the 2019–2020 school year. Specifically, we observed a statistically significant increase in teachers reporting little to no paraprofessional support in 2020–2021. Teachers also reported less Tier 2 and Tier 3 instruction being provided by the classroom teacher, or other school personnel. Lesser-noted sources of support also decreased, with two fewer teachers receiving Title 1 literacy tutor assistance, and no teachers receiving classroom volunteer support (compared to 8% in 2019–2020). Schools needed to limit visitors and volunteers from entering schools to limit COVID 19 transmission and facilitate contact tracing likely account for the reliance on self-contained instruction during in-person learning rather than being able to use volunteers to provide any supplemental literacy instruction (e.g., tutoring).

As of April of 2021, teachers as a group reported teaching in 10 different instructional delivery methods, with the majority of teachers experiencing an average of two changes in the instruction delivery format throughout the 2020–2021 school year. The primary instructional method was generally evenly distributed between face-to-face instruction (33%), virtual (34%), or hybrid (33%). At some point in the school year, 64% of teachers reported being responsible for face-to-face *and* virtual students. This scenario is challenging for teachers who are trying to be present for their face-to-face students, while remaining on-camera to their virtual students (Belsha, 2020). Balancing both learning platforms can lead to burnout (Keeling, 2020).

Time allocated to literacy instruction

Overall, there was a significant decrease in time allocated to literacy instruction from the 2019–2020 school year to the 2020–2021. While the state mandates 90 min of uninterrupted literacy instruction, 40% of teachers fell well below this mark, allocating less than 60 min a day to literacy instruction. Crosson and Silverman (2022) found this reduction of instruction also impacted emergent bilingual students.

Most literacy content was taught face-to-face or synchronously, and most content was taught at least to some degree. However, there was a decrease in time spent in writing, vocabulary, and fluency instruction during the 2020–2021

school year when compared to the previous year. Reduced attention to writing is a concerning trend, as Phase 1 data indicated writing received little instructional time and was the major focus of instruction only 14% of the instructional time reported (Pilonieta et al., 2020). Four teachers (11%) echoed this concern noting "our instructional time has been decreased by 60 min each day. This is time that I normally would have used for small group instruction in both writing and fluency."

Conversely, phonics and phonological awareness were identified as receiving *more* instructional time by 29% and 19% of teachers, respectively. This may be due to teachers noting students' need for foundational skills to support decoding/word recognition and thus compensating for missed instruction in kindergarten when schools switched to emergency remote teaching in March 2020.

Instructional materials and resources used in literacy instruction

Teachers' use of Commercial Comprehensive Curriculum before and during the pandemic remained mostly the same. A few teachers reported adopting a new curriculum during COVID instruction which proved particularly challenging. The use of Commercial Component Specific Curricula also remained the same during both time periods. Though teachers reported using less Commercial Supplemental Curricula, the difference was not statistically significant. There was also a decrease in the use of Teacher Created Materials. This difference was statistically significant as was the decrease in the use of Instructional Frameworks. The decrease was particularly pronounced for teachers who used Fountas and Pinnell guided reading materials.

When considering instructional techniques, the majority of teachers were able to incorporate effective pedagogical practices from face-to-face instruction into their virtual instruction. Teachers who were able to teach face-to-face reported needing to alter their instructional practices due to COVID-19 restrictions.

Limitations and future research

There is a rich history of literacy studies about first grade instruction (Pilonieta et al., 2020; Bond & Dykstra, 1967; Cunningham et al., 2009; Piasta et al., 2009). However, none to our knowledge has been conducted in the context of the COVID 19 pandemic. The purpose of this study was to provide a high-level overview of first grade teachers in one state reported in regard to resources and support provided, materials used, and time allocated for classroom literacy instruction. As such, this is an exploratory study and one in which the findings should be interpreted carefully. For example, one limitation is sample size. Though there was a low number of participants, all regions of the state were represented. In

fact, our response rate to the research invitation was approximately 60%, however we could not include all participants because some were no longer teaching first grade. Another possible reason for low participation could be attributed to teacher burn-out. It is widely understood that teachers were, and continue to be, overwhelmed with a new style and medium for teaching as the pandemic's impact affects school communities well into the 2021–2022 school year. They were also individually dealing with the fears and stressors of a global pandemic. In future research studies, we could expand the scope of the current study to include teachers from other states so that findings are not only more generalizable but nationally representative.

Another limitation to this exploratory study is exclusive use of self-reported data. It is likely that some teachers may have experienced social-desirability bias in that their responses may have been influenced by the desire to report favorable answers. However, on the flip side, teachers' responses, particularly in the 2020–2021 survey, may have been influenced by their feelings and beliefs about teaching in the midst of a pandemic. Finally, teachers did not provide explicit examples to support their observations, perhaps due to restrictions of survey instruments. For example, teachers did not provide anecdotes to describe why they felt students were behind in regards to social skills. In future research endeavors we can include more qualitative techniques with a subset of teachers to capture teacher voice and/or even classroom observations (virtual or in-person).

Conclusion

The COVID-19 pandemic has had, and continues to have, an unprecedented impact on schools, teachers, and students. Our data indicates teachers had increased responsibility as they had reduced access to collaborative planning and the support of paraprofessionals. This increase in responsibility was amplified by the challenges of virtual and hybrid instruction, and the changes in instructional formats experienced by teachers. Concurrently, students experienced less instructional time, particularly in the areas of writing, vocabulary, and fluency. The consequences of these tumultuous experiences for teachers and students are likely to be long-lasting and complex to reconcile, with significant impact on the teaching profession and students' reading proficiency. Policymakers need to develop plans that provide additional literacy instruction and targeted literacy interventions to young learners impacted by the COVID-19 pandemic. Equally important, policymakers need to support teachers so that the burden of pandemic instructional recovery does not fall solely on the already burned-out teachers' shoulders.

Appendix: Classroom Context Questionnaire 2 (CCQ2)

Please enter the zip code of the school where you presently teach: _____

Are you teaching in the same school as last year?

Yes No

Are you still teaching first grade?

Yes No

Classroom Demographic Context

How many students are in your class? _____

How many students in your class:

have an IEP? qualify for ESL? classify as AIG?

Based on Benchmark testing, how many students in your class are reading:

well below benchmark? below benchmark? at or above benchmark?

How many students receive extra support (tier 2 or tier 3) for literacy? _____

Who provides this instruction?

<i>You, as the classroom teacher</i>	<u><i>A different first grade teacher</i></u>
<i>A paraprofessional</i>	<i>An interventionist/ special education teacher</i>
<i>A literacy coach</i>	<i>Volunteers</i>
<i>Others (please describe)</i>	

Indicate the amount of time an instructional assistant (IA) or paraprofessional is in your class working with students during the literacy block:

<i>100% of the time</i>	<i>75% - 99% of the time</i>	<i>50% - 74% of the time</i>
<i>25% - 49% of the time</i>	<i>1 - 24% of the time</i>	<i>I don't have an IA</i>

Instructional Context

During the 20-21 School Year, how would you describe the **primary** method of instructional delivery (if your school tried multiple formats, please respond by indicating the format most of your students experienced most of the time)?

Full-day face-to-face in person learning
*Half-day face-to-face in person learning; half-day virtual **synchronous** instruction*
*Half-day face-to-face in person learning; half-day virtual **asynchronous** instruction*
*Half-day face-to-face in person learning; half-day **synchronous and asynchronous** instruction*
*Alternating full days, some in person learning, some virtual **synchronous** instruction*
*Alternating full days, some in person learning, some virtual **asynchronous** instruction*
*Alternating full days, some in person learning, some virtual **asynchronous instruction and synchronous** instruction*
*Fully virtual, mostly **synchronous** instruction*
*Fully virtual, mostly **asynchronous** instruction*
Fully virtual, equal portions of synchronous and asynchronous
Other

Has the method of instructional delivery changed during the year at your school?

No Yes
 If yes, how many times have you changed instructional delivery methods at your school?

Were/are you responsible for:

Virtual students only *Face to face students only* *Virtual & face to face students*

How many days per week do you provide students with **synchronous** literacy instruction?

1 2 3 4 5

How many **synchronous** minutes do you have, on average, for literacy instruction daily (literacy instruction includes reading, writing, and word work)?

Less than 30 minutes *31-60 minutes* *61-90 minutes*
91-120 minutes *More than 120 minutes*

What are the biggest academic differences you have observed when comparing this year's students to those you taught in 20-21? (open ended, limit to 200 words.)

What are the biggest social and/or emotional differences you have observed when comparing this year's students to those you taught in 20-21? (open ended, limit to 200 words.)

What other differences you have observed when comparing this year's students to those you taught in 20-21? (open ended, limit to 200 words.)

Instructional Decisions & Materials

When planning your literacy instruction, how do you determine the content of your literacy lessons? (select all that apply)

- I have complete autonomy as long as I teach the NC Standard Course of Study*
- I follow the pacing guide developed by the administration or curriculum team/literacy coach.*
- We decide what we teach as a grade level team.*
- Other: Please specify*

Please indicate which of the following materials you use to plan and implement literacy instruction (check all that apply):

- | | | | |
|-----------------------------------|----------------------------------|--------------------------------------|---|
| <i>Core Knowledge</i> | <i>Fundations</i> | <i>Jolly Phonics</i> | <i>Collaborative Classroom</i> |
| <i>Good Habits, Great Readers</i> | <i>I create my own materials</i> | <i>Jan Richardson Guided Reading</i> | <i>Fountas and Pinnell Guided Reading</i> |
| <i>Journeys</i> | <i>LETRS</i> | <i>Letter Land</i> | <i>Lucy Calkins Units of Study</i> |
| <i>Letter People</i> | <i>Making Words</i> | <i>MyView Lit</i> | <i>Open Court</i> |
| <i>Pinterest</i> | <i>Reading Street</i> | <i>Success for All</i> | <i>Teachers Pay Teachers</i> |
| <i>Wit and Wisdom</i> | <i>Words their Way</i> | <i>Epic! books</i> | <i>Reading A to Z (RAZ Kids)</i> |
| <i>Other</i> | | | |

For each of the materials selected above, please indicate the content areas for which they are used (check all that apply):

- | | | |
|-------------------------------|----------------|----------------------|
| <i>Phonological Awareness</i> | <i>Phonics</i> | <i>Vocabulary</i> |
| <i>Writing</i> | <i>fluency</i> | <i>Comprehension</i> |

How frequently do you use {the program selected above} for {the content area selected above}? [question used skip logic]

- | | | |
|------------------------------|-----------------------------|-----------------------------|
| <i>Every day</i> | <i>Most days</i> | <i>Once or twice a week</i> |
| <i>Once or twice a month</i> | <i>Once or twice a year</i> | |

Why do you specifically use the materials that you do?

- It is what I have from last year*
- It is what the district provided specifically for pandemic instruction*
- It is what the school provided specifically for pandemic instruction*
- These are the materials my colleagues and I could easily locate and access*
- These are the materials I alone could easily locate and access*

Use the following scale when answering the next two questions*

- | | | |
|------------------------------|-----------------------------|-----------------------------|
| <i>Every day</i> | <i>Most days</i> | <i>Once or twice a week</i> |
| <i>Once or twice a month</i> | <i>Once or twice a year</i> | |

How frequently do students engage with the following text formats:

- | | | |
|-----------------------|---------------|-------------------|
| <i>Physical books</i> | <i>eBooks</i> | <i>Audiobooks</i> |
|-----------------------|---------------|-------------------|

How frequently do students engage with the following types of text:

- | | | |
|----------------------|----------------------------|--|
| <i>Trade books</i> | <i>Leveled texts</i> | <i>Periodicals</i> |
| <i>Fiction texts</i> | <i>Informational texts</i> | <i>Books provided by the curriculum publishers</i> |

Small Group Instruction

Do your students routinely engage in small group work?

Yes

No

For what instructional purposes do you work with students in small groups? (Check all that apply)

Phonological Awareness

Phonics

Vocabulary

Writing

fluency

Comprehension

Professional Development

Was your literacy instruction observed formally last year (2019-2020 school year)?

Yes

No

Was your literacy instruction observed formally this year (2020-2021 school year)?

Yes

No

If yes, what was the format of the observation? (Check all that apply)

Face to face observation

Synchronous observation (joining you virtually in real time)

Asynchronous observation (e.g., viewing a recording of your instruction)

Asynchronous observation (e.g., viewing your modules or online materials for students)

If yes, what was the format of your instruction during your observation? (Check all that apply)

Face to face instruction

Synchronous virtual teaching

Observation of your asynchronous lessons and materials

Did you attend professional development or do your own research on the following topics

Virtual learning strategies (how to engage students, manage participation, provide feedback, etc.)

Virtual learning technologies (PearDeck, Padlet, Zoom, SeeSaw)

Virtual learning platforms (Google Classroom, Canvas, Blackboard)

I did not attend professional development or do my own research on virtual learning

If yes {to any of the above}, was this PD provided by the district or did you seek out the information on your own?

My school or district provided this PD

I found this information on my own

If yes {to any of the above}, about how many hours did you spend learning about this topic?

0-2 hours

2-4 hours

4-6 hours

More than 6

Do you plan to continue to use any of the technology you used this year in your classroom next year?

Yes

No

Maybe

Please describe how you will continue to use these technologies to impact your future practice (in approximately 200 words).

References

- Belsha, K. (2020 October 1). *Teaching in-person and virtual students at once? It's an instructional nightmare, some educators say*. Chalkbeat. <https://www.chalkbeat.org/2020/10/1/21497795/teaching-in-person-and-virtual-students-at-once-is-an-instructional-nightmare-some-educators-say>
- Bond, G. L., & Dykstra, R. (1967). The cooperative research program in first-grade reading instruction. *Reading Research Quarterly*. <https://doi.org/10.2307/746948>
- Bushweller, K. (2020). How COVID-19 is shaping tech use. What that means when schools reopen; EdWeek Research Center survey reveals good and bad trends. *Education Week*, 39(34), 3.
- Cardoza, K. (2021). "We need to be nurtured, too": Many teachers say they're reaching a breaking point. *National Public Radio*. <https://www.npr.org/2021/04/19/988211478/we-need-to-be-nurtured-too-many-teachers-say-theyre-reaching-a-breaking-point>
- Crosson, A. C., & Silverman, R. D. (2022). Impact of COVID-19 on early literacy instruction for emergent bilinguals. *Reading Research Quarterly*. <https://doi.org/10.1002/rrq.456>

- Crowe, E. C., Connor, C. M., & Petscher, Y. (2009). Examining the core: Relations among reading curricula, poverty, and first through third grade reading achievement. *Journal of School Psychology, 47*, 187–214. <https://doi.org/10.1016/j.jsp.2009.02.002>
- Cunningham, A. E., Zibulsky, J., Stanovich, K. E., & Stanovich, P. J. (2009). How teachers would spend their time teaching language arts: The mismatch between self-reported and best practices. *Journal of Learning Disabilities, 42*, 418–430. <https://doi.org/10.1177/0022219409339063>
- Curriculum Associates. (2021). *What we've learned about unfinished learning: Insights from midyear diagnostic assessments*. <https://www.curriculumassociates.com/-/media/mainsite/files/i-ready/ready-understanding-student-needs-paper-winter-results-2021.pdf>
- Diliberti, M. K., Schwartz, H. L., Hamilton, L. S., & Kaufman, J. H. (2020). *How schools' preparedness related to their remote instruction during COVID-19*. CA: RAND Corporation. https://www.rand.org/pubs/research_reports/RRA168-3.html
- Dorn, E., Hancock, B., Sarakatsannis, J., & Viruleg, E. (2020b). *COVID-19 and student learning in the United States: The hurt could last a lifetime*. McKinsey & Company. <https://www.mckinsey.com/industries/public-and-social-sector/our-insights/COVID-19-and-student-learning-in-the-united-states-the-hurt-could-last-a-lifetime>
- Dorn, E., Hancock, B., Sarakatsannis, J., & Viruleg, E. (2020a). *COVID-19 and learning loss—disparities grow and students need help*. McKinsey & Company. <https://www.mckinsey.com/industries/public-and-social-sector/our-insights/COVID-19-and-student-learning-in-the-united-states-the-hurt-could-last-a-lifetime>
- Duke, N. K., Cervetti, G. N., & Wise, C. N. (2016). The teacher and the classroom. *Journal of Education, 196*(3), 35–43. <https://doi.org/10.1177/002205741619600306>
- Ferren, M. (2021). *Remote learning and school reopenings: What worked and what didn't*. Center for American Progress. <https://www.americanprogress.org/article/remote-learning-school-reopenings-worked-didnt/>
- Guidry, L., McLaren, M., Testino, L., Lohman, I., & Szymanowska, G. (2021, March 16). Students are struggling to read behind masks and screens during COVID-19, but 'expectations are no different'. *USA Today*. <https://www.usatoday.com/in-depth/news/education/2021/03/07/learning-read-amid-covid-online-school-person-kids-lag-behind/4545832001/>
- Hattie, J. A. C. (2009). *Visible learning: A synthesis of over 800 meta-analyses relating to achievement*. Routledge.
- Keeling, J. (2020, November 20). *How to balance in-person and remote learners at the same time*. TeachHub.com. <https://www.teachhub.com/teaching-strategies/2020/11/how-to-balance-in-person-and-remote-learners-at-the-same-time/>
- Kendeou, P., van den Broek, P., White, M. J., & Lynch, J. S. (2009). Predicting reading comprehension in early elementary school: The independent contributions of oral language and decoding skills. *Journal of Educational Psychology, 101*(4), 765–778.
- Kuhfeld, M., Tarasawa, B., Johnson, A., Ruzek, E., & Lewis, K. (2020b). *Learning during COVID-19: Initial findings on students' reading and math achievement and growth*. NWEA Research Brief. <https://www.nwea.org/research/publication/learning-during-COVID-19-initial-findings-on-students-reading-and-math-achievement-and-growth/>
- Kuhfeld, M., Soland, J., Tarasawa, B., Johnson, A., Ruzek, E., & Liu, J. (2020a). Projecting the potential impact of COVID-19 school closures on academic achievement. *Educational Researcher, 49*(8), 549–565. <https://doi.org/10.3102/0013189X20965918>
- Lervåg, A., Humle, C., & Melby-Lervåg, M. (2018). Unpicking the developmental relationship between oral language skills and reading comprehension: It's simple, but complex. *Child Development, 89*(5), 1821–1838.
- Marshall, D. T., Shannon, D. M., & Love, S. M. (2020). How teachers experienced the COVID-19 transition to remote instruction. *Phi Delta Kappan, 102*(3), 46–50. <https://doi.org/10.1177/0031721720970702>
- Middleton, K. V. (2020). The longer-term impact of COVID-19 on K-12 student learning and assessment. *Educational Measurement: Issues and Practice, 39*(3), 41–44. <https://doi.org/10.1111/emip.12368>
- Moats, L. (2009). Knowledge foundation for teaching reading and spelling. *Reading and Writing, 22*, 379–399.
- National Reading Panel. (2000). *Report of the national reading panel: Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction: Reports of the subgroups*. National Institute of Child Health and Human Development, National Institutes of Health.

- National Center for Educational Statistics. (2022). *NTPS State Dashboard, 2017–2018: North Carolina*. Retrieved November 24, 2022 from <https://nces.ed.gov/surveys/ntps/ntpsdashboard/Dashboard/NC>
- Neuendorf, K. A. (2016). *The content analysis guidebook* (2nd ed.). Sage Publications.
- Office of Learning Recovery & Acceleration, NC Department of Public Instruction. (2022). *Key findings snapshot: understanding the COVID-19 learning loss impact analysis*. https://content.govdelivery.com/attachments/NCSBE/2022/03/02/file_attachments/2091580/Key%20Findings%20Briefing%20-%20Final.pdf
- Olneck-Brown, B. (2021). *Public education's response to the Coronavirus (COVID-19) pandemic*. National Conference of State Legislatures. <https://www.ncsl.org/research/education/public-education-response-to-coronavirus-COVID-19.aspx>
- Piasta, S. B., Connor, C. M., Fishman, B. J., & Morrison, F. J. (2009). Teachers' knowledge of literacy concepts, classroom practices, and student reading growth. *Scientific Studies of Reading, 13*(3), 224–248. <https://doi.org/10.1080/10888430902851364>
- Pilonieta, P., Whittingham, C. E., Bastian, K. C., & Comperatore, A. N. (2020). A description of first-grade literacy instruction across North Carolina. https://publicpolicy.unc.edu/wp-content/uploads/sites/107/2020/08/literacy_practices_firstgrade_final.pdf
- Spear-Swerling, L., & Zibulsky, J. (2014). Making time for literacy: Teacher knowledge and time allocation in instructional planning. *Reading and Writing, 27*, 1353–1378. <https://doi.org/10.1007/s11145-013-9491-y>
- Stoetzel, L., & Shedrow, S. J. (2021). Making the move online: Interactive read-alouds for the virtual classroom. *The Reading Teacher, 74*(4), 747–756. <https://doi.org/10.1002/trtr.2006>
- Tivnan, T., & Hemphill, L. (2005). Comparing four literacy reform models in high-poverty schools: Patterns of first-grade achievement. *The Elementary School Journal, 105*(5), 419–441. <https://doi.org/10.1086/431885>
- Underwood, S. (2018). *What is the evidence for an uninterrupted, 90-minute literacy instruction block? Education Northwest Literacy Brief*. Education Northwest. <https://nysrti.org/files/resources/uninterrupted-literacy-block-brief.pdf>

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Springer Nature or its licensor (e.g. a society or other partner) holds exclusive rights to this article under a publishing agreement with the author(s) or other rightsholder(s); author self-archiving of the accepted manuscript version of this article is solely governed by the terms of such publishing agreement and applicable law.