

Elementary mathematics curriculum: State policy, COVID-19, and teacher control

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Abstract

In the U.S., teachers navigate a wide range of factors when curating and adapting curricular resources, including state and district policies, technological accessibility, and contextual conditions such as the COVID-19 pandemic. We used state-level political affiliations to examine how elementary teachers in 46 U.S. states curated and implemented mathematics curricular resources before and during the pandemic. We then examined teachers' responses from 10 states representing Republican, Democratic, and split political affiliations across geographic regions to identify contextual factors shaping curricular curation and implementation during pandemic teaching. Our findings showed that state policies only partially shaped teachers' curricular curation and implementation, as teachers across political contexts encountered similar constraints and opportunities related to student access, engagement, technological resources, and instructional demands. Teachers also described a shift in Fall 2020 toward more structured online schooling, including increased expectations for student attendance, academic work, and learning. We also found some aspects that were influenced by state policy. Teachers in Republican states reported using more mathematics curricular resources before the pandemic and having greater curricular control during remote teaching, although teachers' preparation for remote teaching did not differ by political affiliation. We discuss implications for better positioning teachers to exercise curricular agency when navigating politically and contextually complex circumstances and unforeseen disruptions.

Keywords: mathematics curriculum, state policy, elementary teachers, COVID-19

INTRODUCTION

Teachers' interactions with curricular materials are influenced by several factors, including teacher characteristics (e.g., Remillard & Bryans, 2004), instructional contexts (Keiser & Lambdin, 1996), and curriculum policy (Remillard & Heck, 2014). Unforeseen contextual factors, such as the COVID-19 pandemic (hereafter referred to as "pandemic"), can force rapid shifts in how teachers select, adapt, and enact curriculum resources (e.g., Francom et al., 2021). During the initial months of the pandemic, teachers were abruptly asked to transition into online teaching without adequate preparation and resources for themselves and their students (Baniahmadi et al., 2021). Thus, many

teachers reported they stopped using some curricular resources because those resources were not available or compatible with online instruction (Baniahmadi et al., 2023).

Meanwhile, teachers had to continue to follow state and district guidelines, which necessitated them to adjust their enacted curriculum to meet new assessment requirements (e.g., California Department of Education, 2023; Florida Department of Education, 2023). Contextual factors (e.g., access to technology) also impacted teachers' technology adaptation (Storey & Slavin, 2020). The students, policies, and available funding of school districts and states also impacted technology access. Some states used existing budgetary funds to purchase technology, while others used

Contribution to the literature

- Teachers' curricular decisions are shaped by multiple contextual factors, yet less is known about how teachers negotiate these factors when established curricular routines are disrupted. The COVID-19 pandemic provides a unique context for examining how teachers curated and implemented mathematics curricular resources amid rapidly changing instructional, technological, and policy conditions.
- In our study, we examined U.S. elementary teachers' curricular curation and implementation before and during emergency remote teaching across 46 U.S. states, with particular attention to how state political contexts and local conditions shaped teachers' use of curricular resources and perceived curricular control.
- Our findings showed that state policies shaped the conditions of teachers' curricular work but did not fully determine their curricular decisions. Teachers exercised curricular agency by adapting resources, searching for alternatives, and creating materials to address students' needs and local constraints. Teachers' curricular curation was also influenced by access to free trials, subscriptions, and district-provided resources, demonstrating that the availability and affordability of digital resources determined which materials could become workable curricula during emergency remote teaching.

available resources instead of buying new ones (Turner et al., 2020). National policies add another layer of complexity. For example, in the current context, teachers may need to reconsider which curricular resources to select or implement in response to the "Dear Colleague" letter issued by the acting Assistant Secretary for Civil Rights at the U.S. Department of Education (2025). Again, these scenarios show many layers teachers need to attend to when curating and implementing curricular resources.

In this study, we unpack mathematics curricular resources U.S. elementary teachers were using before the transition to emergency remote teaching in March 2020 and how the pandemic impacted their curricular use. We also investigated the contextual factors that shaped teachers' curricular curation and use during the transition, specifically state policy. We included state policy because educational responses to COVID-19 were highly influenced by state political contexts. To be clear, we do not treat political context as the sole determinant of teachers' curricular curation and use. Instead, we consider it as one of the factors teachers had to navigate when adapting instruction during the pandemic. We report the math curriculum resources used by elementary teachers before and during the pandemic and perceived teacher control related to making curricular decisions with the onset of remote learning in March 2020. In addition, we report on how teachers navigated state policies and contextual factors during the move to remote teaching. We answer the following research questions (RQs):

1. What curricular resources did teachers use prior to the pandemic? How did the number of resources vary across states?
2. How did the use of curricular resources change during the early pandemic when most teachers were engaged in emergency remote teaching? How did the number of curricular resources and amount of control teachers had to choose their resources vary across states?

3. How did teachers adapt to and interpret contextual factors when using curricular resources during the pandemic?

By addressing these questions, we illuminate the immense effort, and complex decision-making elementary teachers undertake when working within decentralized curricular systems with no single national curriculum. We position teachers as contributors to curriculum construction and curation (Silver, 2022), not merely implementers of prescribed materials. Our findings challenge views of teachers as simply consumers and argue their expertise is essential to shaping students' learning and to curriculum development.

THEORETICAL PERSPECTIVES

Curriculum "is not only a stable body of knowledge in accordance with a discipline. It is also about meaning-making and negotiation among different actors in society and the education system, such as politicians, national education authorities, teachers, etc." (Wahlström, 2023, pp. 260-261). Like Wahlström (2023), we argue curriculum is not a fixed entity but is negotiated by teachers as they curate written and intended curriculum and implement it within their contexts. The intended curriculum consists of curricular intentions, aims, and standards set by educational systems (Schmidt et al., 1996), and "teachers' plans for instruction" (Stein et al., 2007, p. 331). Written curriculum indicates the printed and, more recently, online resources associated with the intended curriculum (Stein et al., 2007). The intended curriculum and available resources provide guideposts for teachers as they plan units and lessons.

The term enacted curriculum, in a narrower sense, represents how teachers' plans unfold in the classroom during instruction (Remillard & Heck, 2014). More broadly, it "enlarges the researcher's gaze to include a broad system of curriculum policy, design, and enactment decisions in which the enacted curriculum is

situated, and which operate together to shape it" (p. 706). Remillard and Heck (2014) offered a framework describing the broad system of interactions between teachers' intended, written, and enacted curricula in math classrooms:

The authors situate the enacted mathematics curriculum in the operational part of the system and define it as the interactions between teachers and students around mathematical tasks of a lesson and collection of lessons but argue that understanding what it means to enact curriculum involves examining the many places within the system that curricular elements are translated and transformed (p. 705).

Besides these systematic interactions, teachers' curriculum enactment is influenced by individual characteristics, such as their unique experiences (Choppin, 2011), curricular knowledge (e.g., horizontal and vertical content organization [Shulman, 1986]), and vision (path of student learning [Darling-Hammond et al., 2005]). Thus, enacted curricula may differ greatly from intended and written curricula because of systemic, contextual, and individual factors.

In the U.S., teachers also have varying levels of curricular control within a politicized context. Curricular control refers to the independent decisions teachers make in selecting and using curricular resources and the degree they feel empowered to make curricular decisions in a way that benefits students (Dampson et al., 2019). While teachers' curricular supplementation often reflects their efforts to improve curricular materials for their students and themselves (Polikoff & Silver, 2021), many aspects influencing these decisions lie outside their control. For example, teachers' curricular supplementation manifests within a political system such that state and local funds may be used to purchase a core curricular resource from a politicized market of available resources (Polikoff et al., 2020). The extent these materials are mandated can also be politicized (Cohen & Ball, 1990), and teachers must also navigate how state standards, tests, and evaluation metrics align with those materials (Mathison & Freeman, 2003). Teachers' curation of curriculum, including how they supplement existing materials, is therefore shaped by broader contextual forces and policies (Hu et al., 2018). Thus, how teachers optimize the factors they can control within policy and contextual constraints is worth exploring.

Hu et al. (2018) provide a useful framing for teachers' negotiation of this political context as "curation" of curricular materials, in "response to the curricular policy, and a message detailing both what is expected of [teachers'] own instruction and their students' learning" (p. 316). The curated curriculum reflects the student learning opportunities teachers envision within their system's constraints. Thus, teachers' curricular curation

is influenced by factors operating at both micro and macro levels. At the micro level, curation is context-specific, shaped by student-related and contextual factors such as lesson objectives, students' prior knowledge, instructional goals, resource relevance and rigor, plans for engagement, and mode of delivery (Mullins et al., 2025). At the macro level, teachers' selection and use of resources are influenced by broader social structures and institutional forces (e.g., politics, online resources, and the pandemic), while at the micro level, teachers exercise individual choice in determining which resources are relevant. Institutional contexts and teachers' control or agency interacts in complementary ways, as teachers balance external expectations with their own professional judgments and preferences when curating curricular resources (Torphy et al., 2020).

Macro Level: Federal and State Politics

Every educational system is political (Usiskin, 2007), and federal decisions influence to some extent how teachers enact curriculum (Remillard & Heck, 2014). Nationally, most states have adopted versions of the common core state standards for mathematics (CCSS-M), often with local adjustments. At the state level, local government oversees public schools, and the state policies shape access to curricular resources. Numerous state constitutions explicitly address the development of curricula. Certain state constitutions grant state authorities the power to choose textbooks and educational materials. For example, in Florida, "the district board has the constitutional duty and responsibility to select and provide adequate instructional materials for all students" (The Florida Senate, 2025). In California, "The State Board of Education has constitutional authority to adopt instructional materials for grades one through eight" (California Legislative Information, 2025).

Beyond state constitutional mandates, state governors and legislatures may possess authority to either enact laws or delegate officials (e.g., Secretary of Education) to define, select, and regulate the curriculum. Several media stories in the past few years demonstrate the power of state politics on curriculum. For example, the Florida Governor's inaugural address in January 2023 introduced "anti-woke" measures to "ensure school systems are responsive to parents and to students, not partisan interest groups" (DeSantis, 2023). Soon after, the Florida Department of Education (2025) demanded publishers remove social-emotional learning from textbooks and curricular resources, and the Governor signed a bill into law banning early elementary teachers from discussing sexual orientation and gender identity (Diaz, 2022). These changes influenced the level of control teachers felt over their curricular decisions (Scheimer et al., 2023). In March 2025, Florida's Department of Education released a press statement to restate their commitment to "end racial

preferences in education” (Florida Department of Education, 2025). These statements around educational policy changes very likely influence what and how teachers curate their curricular resources as they need to comply with state policies.

In another example of state-level political influence, the *New York Times* (2023) analyzed textbooks used in Texas and California to show how textbooks with the same authors and publisher were adapted to meet the different political needs and to fulfill the preferences of policymakers with different priorities. They suggested such minor and major changes influence both current instructional opportunities and future voter preferences, highlighting the need of our study, which examines contextual factors and state policies shaping teachers’ curricular choices.

Macro Level: Proliferation of Online Resources

A proliferation of online curricular resources began before the pandemic, and the post-pandemic abundance of such resources has influenced teachers’ curricular curation (Baniahmadi et al., 2021). With the increasingly available online resources, teachers may negotiate how they use their primary mandated curricula and supplement their resources with self-created or downloaded materials from the Internet (Polikoff & Silver, 2021).

Hu et al. (2018) identified three interrelated forms of curation in teachers’ use of online resources. In self-directed curation, teachers intentionally search for materials to address specific instructional needs. Incidental curation occurs when they encounter useful resources by chance, such as on social media. Socialized curation happens through interactions with colleagues and online communities. These forms show the dynamic ways teachers engage with digital materials and highlight the complexity of navigating intended, written, and enacted curricula in a decentralized system like the U.S. with no national curriculum (e.g., Remillard & Heck, 2014).

Macro Level: The Context of COVID-19

The pandemic represented an unprecedented context-specific event (Doyle, 1992) that influenced teachers’ curricular curation. The abrupt shift to remote learning forced U.S. K-12 teachers to quickly adjust their curricular choices. While all 50 states announced school closure in March 2020, the guidelines and resources for remote teaching varied (Reich et al., 2020). Some states published lists of resources, websites, and subscription applications to facilitate teachers’ instructional needs as soon as schools were closed, while others left teachers with both more freedom and less scaffolding. As the pandemic extended beyond the initial closures, states and districts continued developing policies governing remote instruction and the transition back to in-person

teaching. Teachers had to be responsive in their decision-making as state policies and understandings of the pandemic evolved (Baniahmadi et al., 2023). Every state instituted different policies and procedures during the pandemic as historically those types of decisions have been influenced by state policies (Placier et al., 2002). Evidence shows the U.S. pandemic response was politicized (Grossmann et al., 2021), such as, Republican policymakers favoring a swift return to *normal* and Democratic policymakers supporting mask and distancing mandates.

As teachers responded to these policies, they faced unique opportunities and challenges. The sudden transition to online instruction required teachers to adapt their instructional approaches, curriculum delivery, technology use, and communication practices, often with limited preparation and varying levels of access to technological resources (Meisner & McKenzie, 2023). Such adaptation suggests that teachers may have had the potential to experience more control for curricular use during remote teaching. When teachers have more control over curricular choices but also need to attend to institutional policies and students’ needs, they face several challenges (Sapkota et al., 2024). For example, teachers often struggle to select curricular resources that are appropriate to achieve the assessment requirements while also addressing students’ needs (Ormond, 2017), and these effects were likely magnified during the pandemic when student needs and access to resources varied across households (Baniahmadi et al., 2023).

The pandemic also impacted how curriculum was implemented and evaluated as teachers, administrators, and policymakers attempted to create appropriate learning environments for all learners (Huck & Zhang, 2021). Schools, especially those with fewer resources, were challenged to provide access to functioning technology and to develop materials that were accessible to students who had limited access to technology (Giorgio-Doherty et al., 2021; Gross & Opalka, 2020). Teachers needed to use new teaching models that met requirements imposed by schools under the guidance of district and state while also exploring new resources that were accessible to students as they switched teaching modalities (Aguliera & Nightengale-Lee, 2020; Zhou, 2020).

Evidence suggests that in the post-pandemic context, teachers increasingly view themselves as organizers of curricular resources rather than merely instructors (Imran et al., 2025). Following the pandemic, several supplemental resources are being identified from online platforms, even though some may not be considered high-quality (Silver, 2022). In a systematic review, Silver (2022) found consistent patterns in how teachers supplement curriculum, noting that their practices are influenced by personal characteristics, teaching contexts, and contextual factors. Given these trends, we became

interested in understanding how teachers' curricular curation and supplementation were characterized during the unique context of the pandemic. This focus is still relevant as the pandemic's effects on student learning continue to persist. Recent reports indicate that, as of early 2023, students across nearly every state remain approximately half a grade level behind pre-pandemic achievement in mathematics, underscoring the enduring impact of the pandemic on learning regardless of state policies (Axios, 2023).

Micro Level: Teachers' Navigation of Technology During the Pandemic

Teachers faced unprecedented challenges during the pandemic as the primary remote mode of instruction involved incorporation of technology (Baniahmedi et al., 2021; Mecham et al., 2021; Winter et al., 2021). While most U.S. teachers had basic digital competency and access to technology during emergency remote teaching, they were challenged by students' access to technology and meaningful student engagement (Francom et al., 2021). Teachers' effective navigation of technology was often hindered by students' limited access to devices and reliable Internet (Mecham et al., 2021). Teachers were also challenged to engage students effectively during online teaching (Ogodo et al., 2021). In a prior study, we found most U.S. students had access to the technology, but many still encountered barriers such as unreliable Internet, limited access to devices, and shared home workspaces (Baniahmedi et al., 2021).

While these studies provide insights into teachers' challenges and successes around technology navigation, how these technological constraints influenced teachers' curation and implementation of curriculum is underexplored. Our study examines how teachers modified their curation and implementation of curricular materials to address pandemic-related challenges, focusing on how they leveraged available technological resources to meet students' needs.

To sum up, the intended and enacted curriculum may vary for several reasons at both macro and micro levels. The literature suggests teachers' curricular decisions during the pandemic were challenging because of unique state policies, students' access to online resources, and contextual factors. We investigate how teachers' curricular curation and implementation before and during remote teaching were influenced by state politics and local context during the pandemic.

METHODS

Teachers

This study is part of a larger National Science Foundation project. The primary aim of the project was to understand and support elementary teachers' curricular decisions in diverse curricular contexts. The

data presented here are from a survey administered in September 2020 to 524 third-, fourth-, and fifth-grade teachers from 46 states. The majority of the teachers taught in public schools (90%) located in suburban (55%), urban (28%), and rural districts (17%). The data do not identify the specific schools or districts in which the teachers were working.

Defining Curricular Resources

Curricular resources were defined as any materials used by teachers for the purposes of planning, teaching, and/or assessment, such as

- (a) packaged curriculum,
- (b) individual lesson plans and materials, and
- (c) electronic and online resources and apps.

Examples were provided to teacher participants, including textbooks and teacher guides purchased by schools and districts (e.g., Everyday Math), online curricula (e.g., EngageNY), online resources (e.g., IXL), materials downloaded from websites (e.g., TeachersPayTeachers), or materials created by teachers.

Survey Items

We asked teachers about their use of math curricular resources from the beginning of Fall 2019 to early March 2020, the period prior to emergency closures of schools. We also asked them which resources they used during pandemic remote teaching (mid-March 2020 through the end of the academic year). We provided teachers with a list of common elementary math curricula and supplements (i.e., Go Math, Bridges, Big Ideas Math, EnVision, Investigations, Math in Focus, EngageNY/Eureka, Everyday Mathematics, TeachersPayTeachers, Pinterest, IXL, BrainPop, and Zearn) and asked them to indicate whether they used each. We also asked about other resources they used and whether they designed their own materials. If they changed whether they used a curricular resource during pandemic remote teaching, they explained why they made that change. We asked them to rate their level of control over the usage of resources during pandemic remote teaching and their level of preparation to engage in remote teaching on a four-point scale. They shared other experiences related to pandemic remote teaching and student learning. Additional survey questions sought to identify what modalities teachers were using after school closures in Spring 2020 and with many states reopening schools in Fall 2020.

State Politics

We classified the 46 states represented in our data as Democratic, Republican, or split based on the political affiliation of the governor and the party controlling the state legislature in 2020 (at the time of data collection). States in which both the governor and the state

Table 1. State politics coding

Politics	States
Democratic	California, Connecticut, Delaware, Hawaii, Illinois, New Jersey, New Mexico, New York, Nevada, Oregon, Rhode Island, Virginia, Washington
Republican	Alabama, Arizona, Arkansas, Florida, Idaho, Indiana, Mississippi, Missouri, Nebraska, North Carolina, North Dakota, Ohio, Oklahoma, South Dakota, South Carolina, Tennessee, Texas, Utah, West Virginia, and Wyoming
Split	Alaska, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Montana, New Hampshire, North Carolina, Pennsylvania, Vermont, Wisconsin

legislature were controlled by the Democratic Party were coded as Democratic, whereas states in which both the governor and the state legislature were controlled by the Republican Party were coded as Republican. States with divided government (i.e., a governor and state legislature controlled by different parties) were coded as split. Because governors and state legislatures play critical roles in shaping educational policy in U.S. states, this classification allowed us to examine how teachers across different political contexts navigated the pandemic and whether, if at all, their curricular decisions were influenced by state educational policies. The analysis presented here focuses on Republican, Democratic, and split states (Table 1).

Analysis

Curriculum data reflect two time points: the first part of the academic year (September 2019 to early March 2020), and the remainder of the academic year once the pandemic closed schools and teachers and students were engaged in emergency remote instruction. To address our first question, we identified the curricular resources that our participants used before and after the transition to emergency remote teaching. We then compared the frequencies of the resources before and after the transition to emergency remote teaching to determine whether the use of these resources increased or decreased to report shifts in teachers' use of curricular resources.

To better contextualize teachers' responses to specific policy moves and to hear more from teachers in their own words (i.e., RQ3), we also selected states in each of four geographic regions (West, Midwest, Northeast, and South) of the U.S. representing Democratic, Republican, and split states. Through examining additional data collected from teachers in these states, we explored the potential impact of state-level politics' influence on teachers' responses to pandemic policies. These states also represented different policy approaches to managing pandemic instruction.

For these contextual analyses, we report descriptive frequency data and qualitative data from open-ended responses of teacher participants to enhance the credibility and validity of the nationwide findings. We used teachers' responses to four open-ended survey questions as a qualitative data source for these six states. The first was, "Why did you stop using <a curricular

resource> when you started teaching remotely?" A total of 417 responses were collected from this item. The second question was "Why did you start using <a curricular resource> when you started teaching remotely?" We recorded a total of 1086 responses from this question. The third question was, "What other experiences related to remote math teaching and learning would you like to share?" A total of 192 responses were collected from this item. The fourth question was "How do you think your remote teaching in the academic year 2020-2021 might be different from that of Spring 2020." A total of 200 responses were recorded from this question.

To analyze teachers' open-ended responses, we exported responses from the 10 chosen states to Microsoft Excel. The first two authors independently reviewed and coded entire responses using an inductive descriptive coding approach (Saldaña, 2016). Although our review of prior literature helped us to initially identify potential contextual influences on teachers' curricular decision making, such as technology access, state policies, and availability of curricular resources, we were open to identifying additional factors that emerged from teachers' responses. For example, we found teachers discussed how free trial and subscription impacted their curricular curation during the pandemic, which was not explicitly mentioned in the literature but came through open-ended responses.

Afterward, the two coders met to discuss the aspects they noticed and resolved discrepancies they had. This initial independent coding and the follow-up discussion helped us to develop descriptive codes: how teachers used and adapted technology, addressed students' access to instructional resources, described their own preparedness, navigated students' assessment and accountability, and discussed the influence of school district and state policies on their curricular decisions. For example, one author initially identified responses describing access to technology, but the second coder more specifically noted that teachers talked about free trials and subscriptions, which was more specific to the pandemic context and it was different from general access technology. Thus, we reported that as one of our themes in the Findings section. This process allowed us to move from descriptive codes to broader themes representing teachers' curricular curation and implementation.

Table 2. Teachers' use of math curricular resources (ordered alphabetically) prior to the pandemic and during emergency remote teaching

Fall 2019-March 2020 prior to COVID-19	Spring 2020 during emergency remote teaching
Big Ideas Math (5)	Big Ideas Math (5)
Brain Pop (170)	Brain Pop (158)
Bridges (25)	Bridges (25)
Designed My Own (141)	Designed My Own (183)
Engage NY/Eureka (111)	Engage NY/Eureka (89)
Envision Math (129)	Envision Math (119)
Everyday Mathematics (27)	Everyday Mathematics (20)
Go Math (100)	Go Math (77)
Investigations (29)	Investigations (18)
IXL (117)	IXL (119)
Math Expressions (44)	Math Expressions (44)
Math In Focus (20)	Math In Focus (16)
Other (148)	Other (150)
Pinterest (87)	Pinterest (69)
TeachersPayTeachers (253)	TeachersPayTeachers (231)
Zearn (49)	Zearn (50)

After establishing the shared coding framework, we examined patterns across teachers from states classified as Republican-led, Democratic-led, and split based on the governor and state legislature in 2020. Afterward, we also compared the patterns across states, which helped us to further unpack our noticing of the unique state policy and how teachers navigated those policies. Based on this, we found the teachers in two specific states, California and Michigan, reported some unique challenges that the teachers in other states did not report. Thus, we report those two states at the end of the findings section.

FINDINGS

We organize our findings by RQs. First, we list the resources teachers used prior to the emergency remote teaching and how the total number of resources differed across states (**RQ1**). Second, we list the resources teachers used during the pandemic remote teaching and explore teachers' ratings of control across states (**RQ2**). Third, we present frequency, themes, and examples from teachers' voices in ten states to unpack contextual factors influencing teachers' curricular decisions in Democratic, Republican, and split political settings (**RQ3**).

National Finding 1: Teachers Used a Range of Curricular Resources Pre-pandemic

Table 2 shows that the 524 teachers sampled used an expansive range of curricular resources. Some resources were more popular across the nation than others. Prior to the pandemic, many teachers identified they were using TeachersPayTeachers ($n = 253$, 48%), Brain Pop ($n = 170$, 32%), EnVision Math ($n = 129$, 25%), IXL ($n = 117$, 22%), and EngageNY/Eureka ($n = 111$, 21%). Twenty-seven percent of the teachers designed their own curricular resources.

The "other" category was indicated by 28% of teachers. Examples of repeated resources indicated in the "other" category did not rise to the adoption rates of the resources listed in **Table 2**. These included Dreambox ($n = 4$), Education Galaxy ($n = 5$), Freckle ($n = 11$), i-Ready ($n = 22$), Khan Academy ($n = 14$), MobyMax ($n = 8$), My Math ($n = 16$), Origo ($n = 9$), Prodigy ($n = 10$), Ready Math ($n = 9$), Reflex ($n = 7$), Saxon Math ($n = 4$), SplashLearn ($n = 3$), Study Island ($n = 3$), and Xtra Math ($n = 3$).

Across states, teachers reported they used between 0 and 10 curricular resources, with most teachers using one ($n = 145$, 28%), two ($n = 100$, 19%), three ($n = 102$, 20%), or four ($n = 94$, 18%) resources ($M = 2.78$, $SD = 1.62$, $Mdn = 3$). Teachers from Republican states reported a higher mean number of resources used than their peers in Democratic or split states. Teachers from Republican states reported they used between 0 and 10 resources ($M = 3.11$, $SD = 1.76$, $Mdn = 3$). Teachers from Democratic states reported they used between 0 and 7 resources ($M = 2.53$, $SD = 1.43$, $Mdn = 2$). Teachers from split states reported they used between 1 and 7 resources ($M = 2.56$, $SD = 1.53$, $Mdn = 2$).

National Finding 2: Teachers' Use of Curricular Resources Shifted During Pandemic

At the onset of emergency remote teaching, teachers reported declines in the use of most curricular resources. As shown in **Table 2**, the most widely used resources before the pandemic (i.e., those used by greater than 20% of the teachers surveyed) were TeachersPayTeachers, Brain Pop, Envision Math, IXL, and EngageNY/Eureka. All of these declined, except for IXL, an online personalized learning app. IXL was reported to be used by 117 teachers (22%) prior to the pandemic and 119 teachers (23%) during emergency remote teaching. The "other" category remained relatively steady as well,

with 148 teachers (28%) indicating they used other resources pre-pandemic and 150 teachers (29%) during emergency remote teaching. The biggest shift occurred in the number of teachers indicating they had designed their own resources. Prior to the pandemic, 141 teachers (27%) indicated they designed their own curricular resources. This rose to 183 teachers (35%) during pandemic remote teaching.

Across states, the use of curricular resources declined during pandemic remote teaching overall, but this was driven primarily by a reduction of resources in the higher-use Republican states. Across states, teachers reported they used between 0 and 11 resources, with most teachers using one ($n = 129$, 25%), two ($n = 131$, 25%), three ($n = 112$, 21%), or four ($n = 68$, 13%) resources ($M = 2.78$, $SD = 1.62$, $Mdn = 2$). Although the range expanded by one (0 to 11 resources), teachers from Republican states reported on average a decrease in the number of resources they used during emergency remote teaching ($M = 2.72$, $SD = 1.66$, $Mdn = 2$). Teachers from Democratic states were consistent in the number of resources they reported using during emergency remote teaching (Range = 0 to 7, $M = 2.56$, $SD = 1.49$, $Mdn = 2$). Similarly, teachers from split states were consistent in the number of resources they used (Range = 0 to 6, $M = 2.53$, $SD = 1.37$, $Mdn = 2$).

National Finding 3: Teacher Control Varied Across States During Pandemic Teaching

On a scale from 0 ("none at all") to 3 ("complete"), few teachers reported they had complete control ($n = 56$, 11%) over their curricular decisions during emergency remote teaching. About twice as many teachers reported they had no control ($n = 114$, 22%) and slightly more reported they had a lot of control ($n = 148$, 28%). The most common rating was a bit of control ($n = 206$, 39%). This was the same across state level politics, with the most common response "a bit of control" in Republican ($n = 81$, 39%), Democratic ($n = 62$, 35%), and split states ($n = 62$, 45%). The percentage of teachers who reported having no control in Democratic states (28%) and split states (23%) was greater than the percentage of teachers who reported no control in Republican states (16%). Likewise, more teachers in Republican states reported they had total control over their curriculum choices (13%) than in Democratic (10%) or split states (8%).

State Context Matters

In this section, we focus on a subset of Republican, Democratic, and split states from across U.S. geographic regions to explore how teachers navigated the complex curricular and policy landscape during the pandemic. Utah and California represent the West. The only split state in the West was Alaska, and only one teacher responded from that state. Thus, we did not include a split state from the West. Florida, Virginia, and North

Table 3. Number of teachers by region, politics, and state

Region	Politics	State	n
West	Republican	Utah	18
	Democratic	California	48
South	Republican	Florida	67
	Democratic	Virginia	13
	Split	North Carolina	12
Midwest	Republican	Indiana	12
	Democratic	Illinois	10
	Split	Michigan	28
Northeast	Democratic	Connecticut	15
	Split	Pennsylvania	48

Carolina represent the South. Indiana, Illinois and Michigan represent the Midwest. Connecticut and Pennsylvania represent the Northeast. The only Republican state in the Northeast was New Hampshire, and no teachers responded from that state (Table 3).

We chose these states, in part, because they had different pandemic response and policies timelines. All states shifted to online instruction in March 2020 with an expectation that closures would last two weeks. They then recommended the closure of in-person instruction for the rest of the academic year in April or May 2020. However, the reopening timeline and policies were different across states. For example, most schools in Republican states (Utah, Indiana, and Florida) were offering in-person instruction by the beginning of the 2020-2021 academic year. In Utah, the Governor approved the Board of Education's reopening plan in June. The Department of Health issued a mandate for face coverings to be worn in schools in July, but the majority of schools were open for in-person instruction by the beginning of the academic year. In Florida, the Governor announced schools would reopen in June, and although the courts debated the orders, the Department of Education ultimately ordered schools to provide in-person education five days per week by no later than August 31. In Indiana, schools were allowed to reopen for in person starting July 1 if masking and social distancing procedures were in place. In August, the Governor modified the masking mandate to allow students to remove masks if they were socially distanced.

Per policy, the Democratic states largely began the academic year in online or hybrid modalities. In Virginia and Illinois, the state Governors released guidance in June that limited or delayed in person education at the beginning of the school year. For example, Virginia's plan included three phases of reopening (fully remote, in person for up to grade 3, and in person for all). Illinois allowed schools to reopen with guidance for masking, social distancing, temperature checking and reduced gatherings. In Connecticut, the Governor allowed school districts to choose in-person or hybrid instruction as long as public health data suggested they could safely operate in person. California experienced the most dramatic

Table 4. Teachers' reported modality of instruction in Fall 2020

Politics	Region	State	Only or mostly in person	Mix of modalities	Only or mostly remote
Republican	West	Utah	0%	61%	39%
	South	Florida	33%	40%	27%
	Midwest	Indiana	8%	67%	25%
	Northeast				
Democratic	West	California	6%	15%	77%
	South	Virginia	15%	23%	62%
	Midwest	Illinois	10%	10%	80%
	Northeast	Connecticut	7%	80%	13%
Split	West				
	South	North Carolina	0%	42%	58%
	Midwest	Michigan	14%	14%	71%
	Northeast	Pennsylvania	13%	8%	65%

delays to a return to in-person modality. In June, the California Department of Education (2023) released reopening guidance, but in July the Governor set limitations based on county level COVID-19 rates, resulting in the most schools starting the year in online modalities. A year later, only half of California schools were reopened for in person instruction.

Like the Democratic states, split states (Michigan, Pennsylvania, and North Carolina) opened the school year in mostly virtual or hybrid formats. In all the states, the Governors announced schools could reopen for in person instruction and released guidelines to districts to draft reopening plans in June and July. By August, Pennsylvania had revised guidance based on health criteria, resulting in the majority of schools opening in virtual or hybrid settings. In Michigan, legislation removed the requirement for schools to return for in person instruction in August, but school districts were required to review their plans monthly and return to in person instruction when feasible. Like Michigan and Pennsylvania, North Carolina schools were allowed to reopen but most schools were hybrid/virtual at beginning of the school year.

State Finding 1: Teachers Were More Similar than State Policy Would Predict

At first glance, descriptive statistics show teachers across states were similar. As expected, 99% of the teachers ($n = 516$) in the total sample reported their schools shifted to remote learning in Spring 2020. This includes 100% of teachers in Utah, Indiana, California, Virginia, Illinois, Connecticut, North Carolina, and Michigan and 99% of teachers in Florida. We expected those numbers to reflect differences in state policies in returning to in-person instruction during Fall 2020. However, most teachers reported their schools were continuing to offer remote teaching in Fall 2020 in Republican (72% in Utah, 93% in Florida, 75% in Indiana), Democratic (94% in California, 92% in Virginia, 90% in Illinois, 87% in Connecticut), and split states (100% in North Carolina, 82% in Michigan, 92% in Pennsylvania).

What differed was the modalities the teachers reported they were *personally* using in Fall 2020 (Table 4). Most teachers in Republican states (Utah, Florida, Indiana) and one Democratic state (Connecticut) reported they were using a mix of modalities. In the remaining Democratic states (California, Virginia, Illinois) and all split states (North Carolina, Michigan, Pennsylvania) the majority of teachers reported they were teaching only or mostly remote. In no state, even those with requirements to offer in-person instruction, were the majority of teachers teaching only or mostly in person. In every sampled state, the teachers taught online to some degree; No state was fully in person.

Teachers in all states felt underprepared to take on remote teaching (58% of the total sample, $n = 302$) teachers rated themselves as “not at all” prepared for remote teaching. This was consistent across political divides with the largest percentages of teachers in most states, whether they were Republican (50% in Utah, 57%, in Florida.), Democratic (60% in California, 46% in Virginia, 53% in Connecticut) or split states (71% in Pennsylvania) reporting they were “not at all prepared” for the shift. In three states, teachers were more divided in their responses to how prepared they felt. For example, in Indiana one-third (33%) of teachers felt they were prepared “a lot” for remote teaching while another third (33%) said they were “not at all prepared.” Similarly, in both North Carolina and Michigan, teachers were equally divided across feeling “a bit” prepared (50% in North Carolina, 46% in Michigan) and “not at all prepared (50% in North Carolina, 46% in Michigan). In Illinois, 60% of the teachers felt “a bit” prepared.

Additionally, the largest percentage of teachers said the way they used curriculum changed “a lot” during the pandemic across states (59%, $n = 311$) and in most Republican (67% in Utah, 69% in Florida, 67% in Indiana), Democratic (58% in California, 60% in Illinois, 47% in Connecticut), and split states (92% in North Carolina, 50% in Michigan, 63% in Pennsylvania). No Virginia teachers indicated the way they used the curriculum changed not at all, but the teachers were

equally split (31% each) across describing their curricular changes as a bit, a lot, and completely.

State Finding 2: Teachers Across States Shared Commonalities in Navigating the Pandemic

Teachers collectively in Republican, Democratic, and split states shared similarities in terms of how they navigated the challenges, how they engaged students, and how they found new alternative resources. We have captured these under eight themes below.

Theme 1. Recreating regular school hour online

Teachers across all states described Fall 2020 as a shift away from the flexibility and reduced expectations of emergency remote teaching toward a more structured and rigorous online school day. Whereas Spring 2020 often involved optional participation and asynchronous activities, teachers shared students in Fall 2020 were: expected to attend class, complete assigned work, and demonstrate progress. One Illinois teacher explained, “Expectations to have rigor has changed the teaching for the fall. Students are required to complete work assigned and attend class.” Similarly, a North Carolina teacher noted, “Students are required to attend class and work will be graded. In the Spring, attending class and work was optional.” A Pennsylvania teacher also emphasized the similar thing, “Students are being held accountable for academic progress. They must attend and learn.”

These increased expectations were accompanied by greater instructional time and more synchronous interaction. An Illinois teacher described working remotely from “9 to 3:30 every day,” compared with only two hours per day in the Spring, allowing teachers to design “more meaningful activities in teams, in the breakout rooms.” A Pennsylvania teacher similarly reported, “Much more synchronized teaching now. I am zooming close to 5 hours a day,” while another described teaching “on zoom from 9-4 everyday,” including “small group instruction in breakout rooms and also the whole group together.”

These examples show teachers attempted to reconstruct features of the traditional school day—including scheduled attendance, sustained instructional time, graded work, synchronous instruction, and greater accountability—within the online environment. As one teacher succinctly described it, “My instruction now looks more similar to in-person schooling as possible while still being completely digital.”

Theme 2. Unique ways to navigate the challenges and only partly informed by the policies

Our findings suggest every teacher navigated the curricular landscape in somewhat unique ways regardless of similar or different state policies. Because school districts had different resources available and their students had varied levels of access to technology,

teachers made many instructional decisions on their own. In response, many teachers reported the need to create their own resources because the existing resources were no longer useful during remote learning. Almost all the teachers in the ten states reported making their own decisions about pacing during remote teaching. A Florida teacher responded, “my pacing was a little different than the county calendar ... we needed to slow down because of e-learning. Not being able to monitor in real-time makes it hard to check for understanding.” Similarly, a California teacher reflected on her own decisions about pacing. They commented, “I adjusted my pace and worked individually or in small groups with students.” In both cases, the teachers established their own pace to ensure that they had time to assess students’ understanding.

Another similarity was that teachers’ curricular choices in all states were shaped by state mandates restricting certain resources during remote teaching. For example, teachers in some states stopped supplementing their materials with content purchased from TeachersPayTeachers because of policy mandates. When describing why they stopped using BrainPop during remote teaching, A Virginia teacher shared, “our curriculum was set by district. I only planned activities, not curriculum.”

These teachers’ voices highlight that despite different mandates, elementary teachers had similar experiences. Teachers decided at the moment how to adjust pacing in order to ensure that their students had equitable learning opportunities based on their context. At the same time, policies restrict access to curricular resources either by explicitly not allowing teachers to use particular resources or by not purchasing access to resources during remote teaching.

Theme 3. Prioritizing student access and opportunities to engage with activities

Teachers from all ten states shared they prioritized activities that were accessible to students and that better engaged them in learning. Because students within their classrooms had different levels of access to resources, they had to individually consider each student’s context. A teacher from Florida mentioned they stopped using Go Math during remote teaching, commenting, “that was an old curriculum I had in my classroom. I didn’t have any online access for my students.” A California teacher mentioned that they stopped using a supplementary resource (IXL) because their students “didn’t all have devices at home” to use this resource. A Florida teacher stopped using Brain Pop because “the children had a hard time getting the assigned videos on the devices at home. They kept freezing up.”

Related to student access, some teachers also considered students’ age when deciding whether online resources were appropriate for their students. A

California teacher alluded that they were selective about using Brain Pop because she found other resources (e.g., YouTube) that were more appropriate for her young students. She stated, "We only use this to introduce a topic, and there are many other videos on YouTube that are appropriate for my student age group." This quote is indicative of a trend we noted: teachers were not only relying on the mandated or formal mathematics supplemental resources but were also exploring other open platforms to ensure students could access curricular resources at their developmental level. A corollary of this finding is that switching to remote teaching demanded teachers to explore alternative resources from those they used in their classrooms. This led the teachers to find the resources that they and access for free. Depending on what resources they had access to for free, their curricular curation changed. We unpack this aspect in the theme below.

Theme 4. Subscription-based instructional materials

Recall that teachers in all ten states were teaching students online in the Fall 2020 to some extent. When schools abruptly transitioned to remote teaching in the middle of Spring 2020, teachers had to rapidly adopt a wide range of digital platforms and curricular resources. Many of them were initially available through free trials, temporary subscriptions, or limited "freemium" versions, but, in most cases, access changed as the pandemic progressed later. Across all ten states, teachers described subscriptions, free access, and district purchasing decisions as primary factors influencing whether they continued using existing resources or adopted new ones when they returned to Fall 2020 teaching. As such, teachers stopped using many resources because free access, often through trial versions in many cases, ended. For example, a Florida teacher explained they stopped using BrainPOP because their "subscription expired." A California teacher reported discontinuing BrainPOP after their "30-day free trial expired." Likewise, a Virginia teacher stopped using GoMath because she "did not have access."

Conversely, many teachers began using new resources because they became freely available or were purchased by their districts to support online students into the Fall semester. One teacher explained, "Our school paid for a subscription which allows me to monitor student skill development." An Indiana teacher emphasized the importance of district-supported digital resources during remote instruction, stating, "Subscriptions to digital math websites were crucial during this time! IXL, Moby Max, and Xtra Math are necessary!" Similarly, several Connecticut teachers reported adopting EngageNY because their "district got free access" and because it was "Easy to get online free ideas."

Teachers also highlighted how temporary free access influenced their instructional decisions. Several Florida

teachers adopted BrainPOP because it was offered free to schools. One explained, "It was offered free to the school. Students enjoy it and it was easy to link to the platform." Michigan teachers similarly described using district-supported resources because they were temporarily free, with one explaining that the program "was free in the spring, not free in the fall. It is an expensive program," while another shared that it was "District selected to supplement Bridges curriculum. Offered for 90 days free."

Teachers also relied heavily on inexpensive or freely available supplemental materials, particularly from Teachers Pay Teachers. One Pennsylvania teacher continued using the platform because it "did not require outside subscriptions/logins for students." Others described "Just browsing free resources," because they "were offered a free subscription with licenses for each teacher to use." Another teacher in Pennsylvania continued to use a resource because of a "Free offer that [they] extended for two more months to finish the year."

Theme 5. Spending more time on making their own materials

When access to existing curricular materials was unavailable, teachers often created their own resources. As one Virginia teacher explained, "The materials available pre-pandemic were not available or accessible online. I had to create new materials to make it available to students virtually. I spend hours each week making materials accessible for online learning." A Florida teacher mentioned that they moved away from online resources and "they started making packets, there was no need for it anymore." A teacher in Utah also shared that they began creating their own resources because, "There wasn't anything else that fit what [they] needed."

Theme 6. Unpacking affordances of different technological resources

The teachers' responses across the 10 states demonstrate how they unpacked the affordances and limitations of technological resources to support meaningful student engagement in online settings. When technological resources were available, teachers described how they recreated aspects of the in-person classroom, monitoring student learning, and supporting students' different learning paces. For example, teachers described using document cameras to make students' work visible during online instruction. A Florida teacher commented "having a document camera to teach mathematics is a huge plus! It makes it so much easier for my students and I." Similarly, a California teacher "like[d] using [their] doc camera while in Zoom. The students work from home just like they would if in person." Teachers also described how online resources supported their ability to monitor and respond to students' learning. A Utah teacher shared they were

“able to see what students knew/were able to complete, and at what percentage. That helped determine what they needed more practice with and how to move forward.” An Illinois teacher similarly noted “the fact that our math program has our lessons as an online presentation made it easy to teach through zoom.”

Teachers also identified technological affordances for student engagement and flexibility. One Utah teacher reflected, “Online lessons for math were fun. I was able to take some of the strategies created and implemented through online/remote teaching and apply them to teaching this school year.” A Florida teacher “create[d] videos teaching the math lessons so [their] students can watch the replay.”

However, teachers’ responses also revealed limitations in their access to technological resources and the need to adapt when existing resources were insufficient. Across the ten states, teachers reported they often could not use their intended curriculum and instead had to create their own resources or supplement existing curricula with digital tools that were not provided by their schools or districts. Thus, teachers’ technological affordances were not uniform; what they could enact depended on the resources available to them and their students’ access to technology.

Theme 7. Challenges assessing student thinking online

Teachers in all ten states found it challenging to assess students’ mathematical thinking and/or learning during remote teaching. Unlike face-to-face classrooms, where teachers could circulate, observe students’ work, identify misconceptions, and provide immediate feedback, remote learning limited their ability to see students’ mathematical reasoning as it unfolded (i.e., formative assessment challenges). A California teacher explained, “Math teaching is hard through remote learning. The hardest part is checking for understanding. It was easier in person, because you could just go and look at the students’ papers.”

Teachers were worried in part because they could not help students in real time without seeing their work. A Florida teacher explained, “It is very difficult to teach math remotely because you cannot see the work as the students are working. In person, you can watch their steps and correct them when they make a mistake.” A Pennsylvania teacher noted, “There’s not enough time in remote learning and you cannot see what the kids are doing to help them.”

Relatedly, because the teachers could not see student work, they did not know whether students’ responses authentically reflected their own understanding. A Florida teacher was concerned because “Figuring out who actually knows what they’re doing is quite difficult. I am having to rely on the students being honest, rather than just seeing the gaps in understanding.” Similarly, a Utah teacher questioned students’ independent work,

stating, “Online learning makes it very difficult to accurately know where a child is. How much is the student doing independently vs. parents or older siblings helping them with answers.”

Some teachers also were worried about not knowing how much information being taught was retained (aspect of summative assessment) by students as seen in a California teacher’s note, “Teaching online is and will continue to be a struggle. It is impossible to gauge how well the students are retaining what I am teaching.”

Theme 8. Learning loss due to the lack of hands-on experiences

Teachers across all the states described the loss of hands-on learning as the most challenging aspect of remote mathematics teaching because elementary students need opportunities to manipulate concrete materials, physically explore mathematical ideas, and construct conceptual understanding through hands-on experiences. A Connecticut teacher explained, “It is incredibly difficult for young students to not being able to use hands on manipulative when it is often such an abstract concept.” A Florida teacher echoed this concern and stated, “It is extremely hard to teach math remotely. It is a subject that needs to be hands-on manipulative, and my students just do not have what is needed to successfully do that remotely.” A Pennsylvania teacher shared “It is more challenging to teach math virtually than any other subject” because “Math needs to be explored and ‘touch’ so students can count and visualize. This is not possible in the virtual setting.”

Teachers also described how they tried to replace physical manipulatives with digital and virtual elements but it was challenging and that created inequitable learning experiences for students as seen in a California and Indiana teachers quotes below, respectively:

Manipulative use is no more – we have to search for online manipulatives or ask students to find something. Because of varying households and support, not all students have access to their learning in the same way. (California teacher)

Learning new concepts requires hands-on time – it’s hard to do when many students can’t afford to buy certain items or make certain manipulatives. (Indiana teacher)

Teachers tried to address these challenges by providing students with alternative resources for hands-on learning. An Indiana teacher assembled manipulative kits, “I was lucky enough to be given the opportunity to assemble manipulative kits for each student so they could use hands-on learning in conjunction with our virtual lessons.” Michigan teachers also attempted to compensate for missing materials by sending paper versions home, noting, “Manipulatives are a challenge. I

send paper versions home.” In other states, school districts made those kits and/or had other resources to support their students. For example, in Virginia: “school created Learning Kits that were available to be picked up by families. [the teacher] sent home math tools and manipulatives, paper worksheets, art tools, etc.” A Florida teacher “got a grant to get [her] students manipulatives they can use at home.”

These responses suggest teachers did not completely give up on hands-on learning altogether; instead, many teachers invested considerable effort in finding alternatives outside the classroom whenever possible. Still, many teachers believed that those alternatives in the remote instruction could not replace the benefits of classroom-based mathematical exploration. Indiana teachers reflected that “It’s really difficult to teach remotely when so much conceptual learning happens through discovery with manipulatives.” Michigan teachers similarly lamented, “Very hard when students don’t have the manipulatives that they would have in the classroom.”

State Finding 3: Differences in Terms of How Teachers Framed Pandemic Challenges

Theme 1. The challenges of student accountability and teacher preparation

Teachers interpreted their commitment to supporting students under challenging conditions in reference to different structures that had been put in place between Spring 2020 and Fall 2020. Some teachers focused on factors related to students, such as learning, attendance, access to resources, and accountability. A California teacher noted, “We are holding the students accountable for learning; all students have Internet and Chromebooks.” Other teachers emphasized factors related to teachers, such as their own preparedness, professional growth, and access to resources. When teachers emphasized teacher-related factors, they described Fall 2020 teaching in terms of being better prepared because of experience they gained teaching online and resources they identified to support instruction during Spring 2020. A Utah teacher shared, “I am much more proficient now than when schools were suddenly shut down in March. Now, I use Canvas as a platform for all my lesson delivery and grading. My lessons are more consistent in content and structure.” An Indiana teacher shared, “I am a lot better at making assignments. I can create more guided lessons.”

Theme 2. Framing language

The second difference in teachers’ open responses was in the language they used to describe the challenge they faced. Some teachers framed the pandemic challenges as opportunities for growth, often using hopeful and constructive language. For example, a

teacher in California described how remote teaching can be successful if used strategically: “Remote learning can be very successful! I feel confident that my students are learning the content standards!” Similarly, a teacher in Virginia shared the strategies they used to sustain student engagement, “I use two monitors to conduct a lesson and use another iPad to join my Zoom so I can see and hear what is going on in my Zoom class ... We use many hand motions to communicate with each other.” Other teachers’ responses expressed frustration and a sense of discouragement about the difficulties they faced. For example, two teachers in Florida wrote, “Student accountability was extremely difficult if there was no support at home” and “The lack of parent involvement is frustrating.” A teacher in Utah shared a similar experience: “Extremely difficult to implement a new math program without being able to use manipulatives.” An Indiana teacher found, “It’s really difficult to teach” during remote teaching.”

Overall, teachers across states emphasized that their Fall 2020 teaching would be more structured and organized, with more resources and stronger accountability for both teachers and students. However, they differed in how they framed these improvements. Some teachers highlighted these changes through the lens of teacher preparedness, reflecting their focus on growth and instructional capacity. Others described these changes primarily in terms of student learning, reflecting their focus on student accountability and outcomes. Despite these differences in tone, teachers across states demonstrated resilience and adaptability, finding creative ways to support their students and strengthen their practice under unprecedented conditions.

State Finding 4: Unique Experiences Within States

In this section, we briefly highlight some responses that were specific to California and Michigan. We chose only these two states because the teachers in these two states shared some specific aspects that did not appear in other states, thus, was not captured in the themes above.

California

While California was not the only state to enter the Fall 2020 school year in primarily online and virtual formats, they were the state that experienced the greatest delays to getting most students back in face-to-face settings. Districts throughout the state undertook efforts to make sure all students could access virtual learning, but it is perhaps not surprising that California teachers wrote more about the concerns of continued online education. For example, despite indicating they were “not sure that kids on campus is a good idea,” these teachers were likely to write responses that identified particular concerns with remaining physically at a

distance from their students. They referenced difficulties keeping students engaged when there are too many distractions at home. They also worried about “too much screen time.” As one teacher lamented, “We have been teaching online since early August. Our district provided chrome books for all students as well as hot spots throughout the city. It is still wearing for everyone to have limited personal interactions.” While they noted that “remote teaching can be successful,” they also identified it as more “tiring” and “limited.”

Michigan

During online instruction, it was not unusual for teachers across states to be concerned about parents. For example, various teachers across states commented about difficulty getting “buy-in” for the importance of online instructional activities, difficulty asking parents to navigate systems and content without training, or feeling anxious that parents were helping students too much, making it difficult to assess student learning. Michigan, however, was the only state in which teachers expressed concerns about parent evaluation of their efforts, specifically parents judging the quality of the materials they made. As one teacher wrote, “I felt like parents were ‘watching’ and so I needed to use official materials.” Another wrote about the transition back to in person instruction, “Since we are back fully in-person, I could use paper again. I also am more willing to use things I create without parents watching my every move.”

Summary of the Findings

Participating teachers’ curricular curation and implementation during the transition to emergency remote teaching reflected both continuity and reconfiguration. Before the pandemic, teachers used a wide range of curricular resources, with teachers in Republican states reporting a greater number of resources on average. During emergency remote teaching, however, teachers generally reduced the number of resources they used, particularly in Republican states, while increasing self-created materials. Although teachers’ reported curricular control varied somewhat across political contexts, most teachers described having only “a bit” of control, suggesting state politics alone did not determine teachers’ curricular curation. Rather, teachers across Republican, Democratic, and split states encountered many of the same challenges and exercised professional judgment within local constraints. They adjusted pacing, sought alternative resources, and created materials in response to differences in student access, technological affordances, district resources, and the availability of curricular materials. Specifically, free trials, subscriptions, and district-provided resources shaped which materials teachers could adopt or continue using, while limited access to technology and hands-on

materials constrained students’ opportunities to engage in mathematics. Teachers also described difficulties assessing students’ mathematical thinking remotely and recreating the hands-on experiences of in-person mathematics instruction. Thus, although state political contexts were associated with some differences in the number of resources teachers used, their curricular curation and implementation were more broadly shaped by the interaction of policy, local conditions, resource availability, student needs, and professional judgment. Due to these complex interactions, teachers framed pandemic challenges differently: some teachers emphasized student learning opportunities, whereas others often emphasized teacher preparedness, instructional capacity, and structural challenges.

DISCUSSION

Our findings illustrate how elementary teachers’ curricular curation during the pandemic emerged through the interaction of policy, available resources, technology, and local instructional contexts. Teachers did not simply implement an intended or written curriculum; instead, they interpreted and transformed curricular resources in response to what they believed their students needed and what was feasible in their teaching contexts. This finding positions teachers as contributors to curriculum construction and curation (Silver, 2022) and highlights the negotiated nature of curriculum described by Wahlström (2023). In particular, the pandemic made visible how teachers mediated between intended, written, and enacted curriculum as they navigated rapidly changing conditions.

Elementary teachers in our study used a wide range of materials for mathematics teaching prior to the pandemic, with teachers in Republican states utilizing more resources than their peers in Democratic or split states. While no one resource was used by most teachers, several resources were used by more than 20% of participating teachers nationwide, including TeachersPayTeachers and Brain Pop. Slightly less than a third of teachers created their own materials in addition to using existing materials. Curriculum designers should note the relatively high percentages of teachers using TeachersPayTeachers and creating their own materials. Future research should explore why these teacher-made materials remain popular across the nation, even amidst a crowded curricular landscape.

The findings further illustrate the complexity of teachers’ curricular curation as they adapted mathematics teaching to an online environment. Teachers’ selection of instructional resources reflected a balance between their instructional priorities and practical constraints. Although teachers sought resources that supported students’ learning and engagement, their choices were often shaped by what

was freely available, accessible to students, or purchased by their districts. Free trials, district-provided subscriptions, and other accessible online materials are sometimes determined which resources teachers could adopt or continue using. Thus, curricular availability was not simply a matter of what resources existed; teachers' opportunities to use particular resources were also shaped by the material and institutional conditions surrounding their teaching. This finding aligns with the research that shared teachers' interactions with curricular materials are influenced by instructional contexts (Keiser & Lambdin, 1996).

The importance of accessibility was evident in teachers' use of technology. Our findings suggest simply making a resource available online did not make it equally usable for all students. Teachers discontinued some resources because of technological barriers and sought alternative platforms when they believed those platforms would provide greater access or engagement. At the same time, the pandemic pushed teachers to experiment with technologies that supported real-time interaction, including Nearpod and digital manipulatives. These findings suggest teachers were willing to adopt new technologies when they perceived them as supporting student learning, but their choices were mediated by whether students could actually access and use those technologies. While prior research suggests teachers' attitudes and beliefs about technology influence their use of digital tools (Ertmer, 1999; Johnson et al., 2016), our findings highlight how the pandemic compelled nearly all teachers to learn about and experiment with new technologies, regardless of their potential prior orientations toward technology. This has implications for curricular designers and professional learning: digital curricular materials need to account for differences in technological access and should provide flexible ways for teachers to adapt resources to their local contexts. These findings also extend Hu et al.'s (2018) concept of curricular curation by showing curation involved determining not only which resources were desirable but also which could become workable curricula within particular contexts.

Teachers' efforts to preserve hands-on mathematics learning and their concerns about assessing student thinking illustrate how curricular agency during remote teaching involved reconstructing pedagogical practices, not simply selecting or adapting resources. Both concerns reflect the difficulty of maintaining the interactive aspects of mathematics instruction that teachers viewed as essential to supporting students' learning. Teachers sought ways to recreate hands-on experiences through physical or virtual manipulatives. They complained that students' mathematical thinking was not visible when they could no longer readily observe students working, hear their explanations, or respond to their emerging ideas. These efforts and comments highlight the shift to remote teaching

disrupted not only access to curricular materials but also the pedagogical processes through which teachers supported and assessed student learning. These findings show the context of macro level: curation is context-specific, shaped by student-related and contextual factors such as lesson goals, student prior knowledge, resource relevance and rigor, plans for engagement, and mode of delivery (Mullins et al., 2025).

Our findings suggest state policies shaped the conditions of teachers' curricular work but did not fully determine their curricular control or implementation (e.g., Mathison & Freeman, 2003; Usiskin, 2007). Although teachers in Democratic and split states were more likely to report having no curricular control and teachers in Republican states were more likely to report having total control, the most common response across political contexts was that teachers had "a bit" of control. Moreover, differences in state policies did not always translate into differences in teachers' instructional experiences. For example, although state policies regarding school reopening varied along political lines, teachers' reported instructional modalities in Fall 2020 were more similar than these policy differences might suggest. Similarly, teachers across political contexts reduced their resource use during emergency remote teaching and increasingly created their own materials.

Teachers' curricular agency therefore emerged through negotiation among policy expectations, district requirements, resource availability, technological access, and students' learning needs. Where resources were restricted or mandated, teachers had fewer opportunities to tailor curriculum, but they attempted to respond by searching for alternatives, adapting materials, or creating their own. Teachers across varied political contexts encountered many of the same challenges, and how teachers framed them was dependent on their contextual factors (e.g., some focusing on teacher preparedness more vs. others on student accountability). Teachers overall expressed concerns about student accountability and testing in relation to state standards. This finding supports viewing curricular agency as situated within, rather than separate from, broader political and institutional contexts (Torphy et al., 2020).

These findings have implications for the post-pandemic context. Recent research suggests teachers have returned to using online resources more (Imran et al., 2025), which may indicate that the high reliance on teacher-created materials during the pandemic was partly a response to the constraints of emergency remote teaching. At the same time, teachers' decisions to design rather than adopt materials may also reflect their level of trust in available online content (Breyfogle et al., 2010) and their judgments about whether resources could be implemented effectively given constraints such as time and technology. Thus, teachers may benefit from continued professional learning focused not simply on

locating curricular resources but on evaluating, adapting, and curating them for particular students and contexts. This need is especially relevant as teachers encounter rapidly changing technologies, including generative artificial intelligence, alongside new curricular and policy mandates.

CONCLUSION AND IMPLICATIONS

Overall, the pandemic prompted teachers to re-evaluate their curricular resources and instructional approaches. Teachers who typically relied on existing resources felt compelled to create their own because available materials did not adequately address specific contextual factors, and some school districts prohibited the use of resources from platforms such as Teachers Pay Teachers during the pandemic. Some teachers reported that they trusted resources they created themselves more than those developed by others because they could better respond to the unprecedented circumstances, while others created materials because existing resources were no longer suitable for online teaching. The availability of free trials and subscriptions also influenced teachers' curricular decisions. In addition, teachers expressed concerns about their inability to provide hands-on learning experiences and conduct formative assessments, which limited their ability to support students as effectively as they hoped. Across these findings, a common theme was the expertise teachers brought to the construction of their enacted curriculum, drawing on their knowledge of their local contexts to address limitations in mandated curricula and better meet students' needs across different contexts.

By unpacking how teachers curated and used intended and written curriculum during the pandemic, we extend the conversation about influence of curriculum policy and contextual factors on teachers' curricular choices. Our research validates prior scholarship suggesting teachers' curricular decisions are shaped by their instructional contexts (Keiser & Lambdin, 1996) and curriculum policy (Remillard & Heck, 2014). Our findings further demonstrate that teachers' curation and implementation of curricula were shaped by factors at both macro and micro levels, aligning with Hu et al. (2018). At the macro level, teachers' overall curricular curation decreased as the pandemic began, likely due to systemic disruptions and limited institutional support. At the micro level, teachers shared they created more curricular resources to meet student needs and for better student engagement.

We argue these findings further suggest the need to create opportunities to learn from teachers' perspectives as curricular materials are developed and for policymakers to work on creating more opportunities for teachers to engage in the curricular development process. Despite their pivotal role, the dedication and

expertise of elementary teachers in the U.S. often go unrecognized. We assert that elementary teachers should not be only positioned as curators and implementers of curriculum, but they should be seen as creators of curriculum. We recommend that teachers may benefit from professional development to collaboratively learn to write curriculum and about the ways that enacted curricula differ from intended curricula in response to contextual and student factors. An additional recommendation based on the degree to which teachers were making individual decisions to meet student needs may be to ensure that teachers' voices are included in policy debates about curriculum when enacting policies that impact teachers' usage of curriculum and accountability to the intended curriculum.

Limitations of this study include that the data were generated from teacher self-reports and that while there was an attempt to secure a sample across states, we could not ensure teachers were sampled equitably across political and economic boundaries. We were also unable to determine the districts in which teachers worked. It is possible that national and state policy is further complicated by local district and school contexts. Further, the timing of the survey (the first fall semester after the initial onset of the pandemic) may have influenced teachers' time and ability to respond as they were still engaging in rapid instructional shifts due to pandemic policies that differed across state lines. Findings may not be generalizable to current contexts.

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