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Lessons for Improving Curriculum from the COVID–19 Pandemic

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There have been countless challenges faced by American families with school-aged children during the COVID-19 pandemic. Among the many challenges specifically relating to education has been ensuring children had access to a challenging academic curriculum. Whether children have been educated remotely or in hybrid settings, or whether they have been in a pod or homeschool, there have been barriers to the provision of a quality curriculum, such as:

- Whether the school's curriculum materials (if there were any) are suitable for remote, homeschool, or pod instruction.

- Whether teachers (whether regular certified teachers, homeschooling parents, or pod teachers) have the knowledge and skill to select and implement needed core and supplementary curriculum materials.

- Whether and how teachers are supplementing the core curriculum materials with enrichment activities and activities matched to student needs.

To be sure, these and other barriers also largely pre-dated the pandemic—the barriers to the effective adoption and implementation of curriculum materials are many (Polikoff, 2018). But the pandemic created new and important challenges in the area of curriculum that merit policy attention moving forward.

The purpose of this paper is to examine how the COVID-19 pandemic affected the ways curriculum materials were used and identify lessons that could help improve access to quality curriculum and instruction moving forward, whether children are being educated in school, remotely, or in a homeschool/pod setting. What were the implementation issues that arose during the pandemic? What are the lessons from the pandemic for public schools, homeschools, and pods moving forward? How can policymakers proactively design curriculum policies and infrastructural supports to better prepare for future disruptions and to ensure students being educated in a

variety of modalities/structures receive a quality curriculum? These are the questions I seek to answer in this paper.

To address these questions, I synthesize evidence from a variety of data sources tracking teacher and family experiences with instruction during the COVID-19 pandemic. Primarily, I draw on survey results from a survey of American families (the Understanding America Study at the University of Southern California) and surveys of American educators (the American Educator Panels at RAND). I also draw on interview and survey data collected by the Center for Reinventing Public Education (CRPE at Arizona State University) from a study of families engaged in pods or homeschooling.

In what follows, I first briefly discuss important contextual issues with regard to the curriculum in U.S. schools. Next, I present evidence about COVID-specific curriculum issues that emerged during the pandemic. And finally, I make specific policy suggestions to support better curriculum opportunities for students across the range of modalities and structures for providing public education.

The Curriculum in U.S. Schools Pre-COVID

This paper focuses on curriculum materials in the classroom. Curriculum materials are any materials teachers use to implement instruction in the classroom (see Polikoff et al., 2018 for a further discussion of definitions). The archetype form of curriculum material is a textbook—a traditional paper volume that contains a comprehensive (often year-long) curriculum. But curriculum materials increasingly comprise a wide array of different materials. There are "core" curriculum materials, which include both textbooks and digital materials that are meant to include a whole term's instruction. These can be formally adopted, meaning that they are selected at the school or district level, or they can be individually chosen by the teacher. There are also "supplemental" curriculum materials, which Silver (in press) defines as any premeditated, additive change that a teacher makes to their official curriculum materials. Supplemental materials can include (among other things) lessons from prior textbooks, worksheets, teacher-created materials, or materials from any number of lesson-sharing websites such as Teachers Pay Teachers, Google, or Pinterest.

Curriculum materials are a worthy topic of research because research makes clear that these materials shape teachers' instruction and, through it, student learning (though far from fully in either case). The concept of "opportunity to learn" has often been used to study curriculum materials' effects on student learning (Polikoff et al., 2018). These materials often represent a bridge between the "intended curriculum" (i.e., state or other content standards) and the "enacted curriculum" (i.e., what actually gets taught in the classroom, see Porter & Smithson, 2001). Curriculum materials affect student learning both through the content and methods embedded in the materials and through the implementation decisions teachers make when using the materials (Remillard, 2005). Several quantitative studies have also shown direct effects of textbooks on student learning (e.g., Bhatt & Koedel, 2012; Bhatt et al., 2013; Koedel et al., 2017), though some studies have found no such effect (Blazar et al., 2020; Savage et al., 2021).

Despite the potential promise of curriculum materials as a reform lever (Chingos & Whitehurst, 2012), there are a number of important features of the U.S. education system that make it more difficult for materials to have the effects on instruction and learning advocates might hope for (Polikoff, 2018). In the rest of this section, I briefly summarize some of the pre-COVID evidence about the adoption and use of curriculum materials that bears on the curriculum issues that arose during the pandemic. It is worth noting that many of these issues are difficult to get accurate numbers on due to the poor quality of available data on curriculum materials (Polikoff, 2018).

The Curriculum Market is Highly Decentralized

Curriculum decisions in U.S. schools are remarkably decentralized along most every dimension imaginable (for a full discussion of this issue, see Polikoff, 2021). There are more than 13,000 school districts in the 50 states, and in half or more of these states districts have total control when it comes to curriculum adoption decisions. In some states, the department of education puts out lists of approved textbooks, but in close to all states that offer such lists they are strictly advisory (districts can adopt any material, on list or off). The result is that for most public schools in the U.S. curriculum decisions are made locally at the school or district level. Recent research (Polikoff, Campbell, et al., 2020) studied the actual adoption processes in a sample of California districts, finding that these structural features—especially the lack of guidance about what materials to adopt or even how to evaluate available materials—led to districts implementing complex, elaborate adoption policies that seemed to have little bearing on the quality of the materials they eventually adopted. In short, evaluating materials is complex and not straightforward, even for educators who have some expertise and experience in doing so.

Due to the decentralization in curriculum adoption decisions, the actual adopted materials vary considerably within and across states. For example, in one six-state representative study of elementary mathematics curriculum materials, 38 different textbooks were reported used across the states (Blazar et al., 2020). In another study of ELA teachers in three states, it was more than 50 distinct materials (Polikoff, Wang, et al., 2020). While in some states there is more centralization (approximately 60% of Louisiana schools used one mathematics material, Blazar et al., 2020), in other states there was much less (in California and Maryland no more than 18% of schools used any one material).

The decentralization of curriculum materials has important implications for education during the COVID era. For instance, if states rarely even provide local districts with concrete guidance or expectations regarding curriculum materials adoption, the guidance they provide to families and homeschool parents must surely be even weaker (if it exists at all). And if professional educators are unsure how to evaluate materials and make complex adoption decisions, how well equipped can parents or pod teachers be to make those same decisions? More practically, the decentralization in the market means that two students from neighboring districts who might want to be educated together in a homeschool or pod are unlikely to be using the same core materials. To the extent that the homeschool or pod instructor would seek to keep up with the core curriculum, then, they would have to use two different sets of materials.

Many Teachers Do Not Have Core Curriculum Materials

While there is perhaps popular perception that teachers all have textbooks to draw from, the reality is that many teachers are not given core curriculum materials. In state-representative surveys of Louisiana, Massachusetts, and Rhode Island districts (Polikoff, Wang, et al., 2020), fully 56% of district leaders reported that they did not require or recommend any materials for middle school ELA teachers to use (an additional 6% said they recommended but did not require materials). The numbers were even lower for high school, with just 34% of district leaders reporting they recommended or required any materials at all. There is not great data on these issues across subjects and grades, but it is likely that mathematics and science teachers are more likely to be given core materials and teachers of other subjects are less likely.

These findings have obvious implications for education during the COVID pandemic. If schools and districts are not providing any core curriculum materials to teachers, this suggests that students in a hybrid/remote situation might not have access to any particular textbook or other curriculum to use at home. Similarly, for homeschool or pod parents/teachers who plan to one day reintegrate students into the traditional public school, it may not be clear what core materials, if any, to use for instruction to keep up with (or exceed) students in local public schools.

Many Teachers Who Have Core Materials Do Not Have Materials Well Aligned to Standards

Large proportions of the core curriculum materials available on the market are indeed not aligned with standards. The organization EdReports conducts alignment reviews of available materials; of the available materials that have been reviewed on their website, fewer than half of the materials in both mathematics and English language arts met all three criteria for alignment. In my own research, I have found substantial gaps in content between some of the most-adopted mathematics textbooks and the standards they claim to align with (Polikoff, 2015).

It is not just that many books that are on the market are not well aligned to standards, but also that districts do not seem to systematically adopt the standards-aligned materials that are available. In a 2020 study of ELA teachers in Louisiana, Massachusetts, and Rhode Island (Polikoff, Wang, et al., 2020), just 34% of teachers reported regularly using a standards-aligned material (i.e., once a week or more). The number was far higher in Louisiana (78%) than in Massachusetts (6%) or Rhode Island (25%). Of course, these numbers reflect both districts' adoption decisions and also teachers' decisions about whether to use the materials, given how the question was asked.

The poor alignment of available/adopted materials also has implications for education during the COVID era. For instance, if most districts have not adopted aligned materials, then even if they do provide parents with those materials for virtual/hybrid, homeschool, or pod instruction, it does not mean that students will necessarily be exposed to aligned content if parents use those materials. Furthermore, it implies that if parents or homeschool/pod teachers select their own core curriculum materials from those available on the market, that they may also not be well aligned with standards.

Virtually All Teachers Supplement Their Core Materials; Many Supplement Substantially

The final important feature of the curriculum in American schools is that teachers exercise substantial control over the curriculum. It is indeed the single area over which teachers report the greatest control in national surveys (Ingersoll, 2003), and this has remained the case even in the current standards era (Grissom et al., 2014). Interviews with teachers also make clear that their instructional authority—especially as pertains to the selection and use of curriculum materials—is very rarely circumscribed, even in districts where more curricular guidance (e.g., through a pacing guide) is offered (Polikoff, 2021).

Not surprisingly, then, teachers supplement their core curriculum extensively. For instance, greater than 95% of teachers (both elementary and secondary) report using Google to select curriculum materials (Opfer et al., 2016). Elementary mathematics teachers reported using teacher-created materials in nearly one-third of all lessons (Blazar et al., 2020). And the website Teachers Pay Teachers claims that millions of U.S. teachers have accounts with which to access the many millions of resources available on the site.

The extent of teacher control and supplementation has direct implications for education during the COVID pandemic. For instance, many of the people involved in delivering homeschool or pod instruction during the pandemic are former teachers, people who prepared to be teachers, or people who performed other functions in schools. These individuals are likely accustomed to the idea that curriculum should be cobbled together from multiple sources and therefore feel that they should deliver instruction in this way. A high degree of teacher control and supplementation also implies that parents having to navigate hybrid instruction at home will not simply be able to "go by the book," as that is unlikely to be how teachers handle the curriculum.

Curriculum Issues During the Pandemic

There is a variety of evidence that many of these curriculum issues have been exacerbated during the pandemic, and that new curriculum-related issues have arisen. In this section, I review the evidence we have about the pandemic's impact on access to quality curriculum and instruction to date.

Student Access to School-Provided Curriculum Declined Dramatically

Along multiple dimensions, it was clear that students were far less able than pre-pandemic to have access to a quality curriculum. As noted above, many teachers pre-COVID did not have access to core curriculum materials. Most of what teachers did have were materials that were not well suited to a rapid transition to online learning (Kaufman, 2020). There were countless news reports early in the pandemic about teachers scrambling to assemble or implement packets of materials or lessons drawn from online lesson-sharing repositories like Teachers Pay Teachers. And indeed, early in the pandemic, teachers did not report that they were generally using core materials

to teach the new content they would have in a normal year—just 12% indicated they were covering all or nearly all of the curriculum they would have covered if school remained open, versus about 20% saying they were doing "all or mostly all" review (Hamilton et al., 2020). Teachers' reported instructional time in the early days of the pandemic also plummeted by more than two-thirds (Jones et al., 2021), and data from Zearn showed student participation in online learning falling off a cliff by 30% or more (see www.tracktherecovery.org).

Furthermore, teachers reported moderate to low levels of preparation and support to deliver remote curriculum early in the pandemic. For instance, more than a third of teachers (38%) indicated they had not received any training in how to use virtual learning management platforms and technology when surveyed early in the pandemic (Hamilton et al., 2020). And just 37% agreed in 2020-21 that they had "received the trainings that enable us to implement our curricula effectively" (Educators for Excellence, 2021). Even in the 2020-21 school year, just under a third of teachers (31%) in a national survey agreed that their curricula were easy to adapt for distance learning (Educators for Excellence, 2021). Fifty-three percent of teachers indicated they needed academic lesson plans to use with students while their school building was closed (Hamilton et al., 2020). Perhaps in part because of these curriculum issues and teachers' lack of support for pandemic learning, parents' grades of the "quality of instruction" in science, mathematics, and English language arts were substantially lower in the spring and fall of 2020 than they were pre-COVID (Rapaport et al., 2020).

While the core curriculum was a major area of need, teachers actually reported greater curricular needs in areas like social/emotional learning and hands-on learning opportunities (types of materials that may be less available or lower quality in online repositories). For instance, while 53% of teachers in a national survey indicated they needed academic lesson plans, 72% indicated they needed social and emotional learning lesson plans and strategies, and 74% indicated they needed strategies or resources to address the loss of hands-on learning opportunities (Hamilton et al., 2020). Perhaps in part due to these curriculum-related burdens, teachers' reported workloads increased substantially as compared to pre-pandemic (Kaufman & Diliberti, 2021). Thus, while traditional materials for the core subjects fell short, teachers in both online/hybrid and homeschool/pod configurations are likely to need support in sourcing curriculum outside these core areas and implementing it without dramatically increasing their workloads.

Another barrier to curriculum access during the pandemic was technology—both hardware and adequate internet bandwidth. At the end of the 2019-20 school year, virtually all students were remote, but many students remained remote throughout substantial proportions of the 2020-21 school year as well (Haderlein et al., 2021). Early in the pandemic, nationally representative survey data found that about 15% of families did not have access to internet or sufficient technology to participate in distance learning (Polikoff, Saavedra, et al., 2020). By the fall of 2020 these numbers had improved, but there were still troubling gaps in access to adequate technology (Haderlein et al., 2021), such as:

- Still 9.3% of families reported students had to share devices for learning, and 3.4% said they had no devices.

- Nearly a quarter of families (22%) still had poor internet connectivity.

Clearly, there were important ongoing issues with access to technology as the pandemic continued. In a national survey of teachers conducted early in 2021, fully 83% of teachers said "technology or reliable internet access" was a very serious or somewhat serious obstacle to student progress (Educators for Excellence, 2021). Clearly, many students lacked access to a quality school-provided curriculum throughout much of the pandemic given these findings.

Reliance on Home-Provided Learning Supports Increased Dramatically

With the dip in already-limited access to quality curriculum, there was a corresponding increase in demand for home-provided instructional supports. In other words, parents or homeschool/pod instructors had to pick up some of the curricular slack left by the issues raised just above. Here, too, there were important issues of access and lack of preparation. Some of these issues were described in the interviews and surveys with pod families conducted by CRPE.

For instance, parents noted the immense burden of trying to assemble their own curriculum and their inadequate preparation to do so. For instance, one parent said:

> So, initially, we were trying to teach them, which basically is hilarious because [the pod teacher was] like, "I'm a teacher, but apparently I don't know how to teach first grade." So we would photocopy workbooks and just basically bring those in. And then I realized, again, I am just not good with little kids. I just basically turned every day into just a walk or nature walk or play day because I was just like, "I can't think of things to do with you guys." …

Even when the pod teacher was a former public school teacher, the burden of trying to put together a curriculum from scratch was daunting:

> … Since she was a former teacher within our school district and still had a lot of connections with the school district, she decided she was going to develop her own curriculum and follow our school district's curriculum so that they would be in line with that. At the end of the semester, she decided that was just way too much. And it wasn't really probably the best path to take. So we ended up purchasing a curriculum of her choosing for her to use the second semester.

When parents didn't have access to core materials because the local district did not provide them with any, they noted the difficulty in assembling curricula. For instance, one respondent noted "Sometimes I have to find things online just because we don't have access to the books."

Nationally representative survey data from the fall of 2020 echo these challenges and show they applied more broadly than just pod parents. For instance, only 63% to 72% of responding parents said they could "mostly" or "very much" help with student homework in mathematics, science, social studies, and English language arts (Haderlein et al., 2021), meaning a quarter to a third of parents were less confident in their abilities to help students in these areas. There were enormous grade-level differences; just 47% of parents of secondary students said they could mostly or very much help with mathematics homework, as compared to 81% of

parents of elementary students. These results make clear that many parents lacked the confidence to support their children with curricular issues, and that is likely true whether those parents were homeschool/pod parents or parents of children doing remote/hybrid instruction.

Despite the lack of confidence among parents that they could provide adequate instructional support, there was clearly high demand among parents for educational resources to support their children. One national study of parents' web searches indicated substantial increases in parents' searches for both school-centered resources (e.g., Google Classroom, up 95%; Khan Academy, up 50%) and parent-centered resources (e.g., "online school", up 50%; "online classes," up 67%) (Bacher-Hicks, et al., 2021). These results may imply that curricular supports for parents may need to be very actively disseminated, rather than simply passively placed on a website.

Across School-Provided and Parent-Provided Curriculum, There Were Large Gaps Along Multiple Axes of Inequality

With regard to all the pandemic issues previously mentioned, there were large gaps along preexisting axes of inequality. Early in the pandemic, for instance, student access to the Zearn curriculum platform declined dramatically (by 30 to 50%) for students in low-income ZIP codes while hardly changing at all in more affluent areas (Bailey, 2021). And of course gaps in access to in-person learning opportunities along racial-ethnic lines were enormous throughout the 2020-21 school year (for instance, in February/March of 2021, 57% of Black families were remote versus just 27% of White families, see Haderlein et al., 2021).

In terms of the technology to access school-provided curriculum, families from the lowest-income quintile were substantially more likely to lack sufficient technology or internet in the first year of the pandemic (37%, vs. 15% for the overall population).

Recommendations for Curriculum Beyond the Pandemic

Though pandemic teaching is unfortunately not over, it is important to think about how we can emerge from the pandemic with a stronger infrastructure and supports for quality curriculum, whether provided in person, through remote learning, or in homeschool/pod settings. In other words, the pandemic did not cause students to lack access to quality curriculum or adequate technology to access curriculum at home—those were longstanding weaknesses of our educational systems as described above. However, the pandemic both called attention to these existing weaknesses and exacerbated them in some ways. Furthermore, whether in a pandemic or not, there is clearly increased interest among families in various forms of home-based or virtual learning approaches, and there is clearly inadequate support for these new structures. Thus, the purpose of this section is to make recommendations for stronger curricular opportunities moving forward, and opportunities that can be flexibly used regardless of instructional modality. For this section, I draw primarily on interviews and surveys with pod families conducted by CRPE, though I also bring in other data where relevant.

RECOMMENDATION 1: ALL LEARNING MUST START WITH A STRONG CORE CURRICULUM

Over the last decade, there has been an increasing focus in educational policy on strengthening the core curriculum to drive instructional improvement (Chingos & Whitehurst, 2021; Polikoff, 2021). States have ebbed and flowed in their approaches to curriculum policy, but there is growing interest in state-led curriculum reform. For instance, Louisiana has had prominent and well-respected curriculum related reforms that include:

- Identifying a small number of core materials as "Tier 1" that districts are strongly encouraged to adopt from.

- Creating high-quality core materials where they view the market as providing insufficient quality.

- Providing aligned professional learning activities to thousands of teachers throughout the state to support curriculum implementation.

The results of these efforts are that Louisiana teachers demonstrate better knowledge of the standards and report instructional efforts that are more in line with the standards than teachers in other states (Kaufman et al., 2016). Louisiana teachers also report more coherence in multiple dimensions of their instructional systems, suggesting that quality core materials are a centerpiece in reform efforts (Polikoff, Wang, et al., 2020).

Still, far too many teachers lack access to quality curriculum resources (Polikoff, Wang, et al., 2020), and the problem is even greater for home-based learning structures like pods and homeschooling arrangements. Many of the parents interviewed by CRPE researchers indicated a desire or need for a core curriculum. One practical reason parents supported a core curriculum was that it helped students stay on track with their local school, "They're actually using the same textbooks that they're using at school for math and for English in a lot of ways. And I'm still going by the core curriculum for every grade..."

The clear implication of the findings discussed above is that all children must have access to quality core curriculum materials, whether those children are being educated in traditional public schools, schools of choice, or homeschool/pod arrangements. This is true not just in mathematics and ELA—ensuring that high-quality core materials are available for all to use across the educational core is a basic function of state departments of education (Polikoff, 2021). To the extent these core materials are digital, this means that families will also need access to adequate technology and internet to access the materials (something that is perhaps not the responsibility of individual local school districts but is clearly a responsibility of state governments). Ideally there would be a relatively modest number and variety of materials adopted, which could support economies of scale in implementation (see Polikoff, 2021), and might make it more seamless for students in homeschool or pod arrangements to follow along and transfer back in as desired.

To be sure, there may be special additional considerations for nontraditional providers like pod and homeschool parents. CRPE interviewees sometimes noted issues in accessing the core curriculum materials. For instance, one respondent said

"… A lot of these programs are not, they've been dealing with big school districts so much, they won't even talk to you unless you can buy a hundred licenses." This respondent added "… I don't think it would've been that difficult for [these digital curriculum providers] to figure that out, but there wasn't the interest… I was lucky because I have access to this nonprofit that provides, I've got all the same books that my students would have anyway." One further implication of this comment is that it must not be up to individual families to identify and obtain access to core curriculum materials. Rather, there needs to be an organization or organizations that work with digital curriculum providers to ensure that all children have easy access to these materials. The most logical such organizations would again be local school districts or—even better—state departments of education. A state department of education could require that providers of curricula used in public schools in the state offer digital licenses to families, or could use their buying power to obtain licenses that allowed non-district providers to have access to materials regardless of the setting in which children were to be using the materials.

RECOMMENDATION 2: SUPPORTS FOR PERSONALIZATION ARE ESSENTIAL

Of course, core curriculum materials do not solve the problem of ensuring all students have access to a curriculum that is appropriately challenging for them, and again this is true whether students are being educated in person in a traditional setting or in an online, homeschool, or pod configuration. Perhaps the most predominant theme throughout the interviews was the need for—and the challenge of—personalizing the curriculum for individual students. Interestingly, personalizing instruction may actually be more feasible in nontraditional settings like homeschooling or pod configurations, where the simple number of students is more manageable. But regardless of the setting, there is a widespread need and desire to provide customized, personalized instruction to meet student needs and interests.

The interviews with pod parents shed a great deal of light on the personalization issue and offer suggestions that are likely applicable regardless of modality. One theme is that there is a great range of student abilities in any classrooms, even a pod/homeschool setting with just a handful of students. For instance, interviewees often reported their students were performing beyond grade-level and therefore needed supports to access more advanced curriculum: "…My second graders have already finished their second grade math book because they're both really good at math and so now they're doing third grade math and I have them working collaboratively with third graders doing multiplication." Another similarly indicated "we've gone well beyond what they are studying in second grade, but I try to make sure that I'm not leaving holes, especially with phonics and reading skills." What is true in a small pod arrangement is undoubtedly true even more so in a classroom with 20-30 students. Schools are not often well set up to provide appropriate curricular challenge to students who are far ahead and far behind, and they need to create curricular structures that allow all students to get the support they need (whether advanced, on-grade, or remedial).

Given the challenges associated with personalization, it is clear that technology will play some role in personalization. Interviews with pod families called out the important role of digital curriculum materials in supporting personalization, and this

is undoubtedly true in traditional classrooms as well. For instance, one interviewee noted:

> That's where Khan Academy was very beneficial for me, because that's the one thing that I did do electronically with them was have all my kids on a Khan Academy account so they could also work remotely at home and do extra work if they wanted to. But then I could have an accurate gauge of where they were at specifically with math and ELA throughout the year and whatever they didn't master, I could work additionally with them also.

Other interviewees also mentioned Khan Academy and other digital resources as tools for personalization. Thus, another recommendation is that schools and districts identify digital or other resources that are specifically targeted at personalization and provide them to teachers with appropriate supports for use. These supports should include, at minimum some basic training on how to use the materials and how they should integrate with the core curriculum, and they should be made available both to traditional teachers and homeschool/pod parents. These materials should have embedded assessments to gauge students' current levels of performance and more accurately target instruction.

It is not merely that curriculum should be personalized to student abilities, but also to their interests. Of course, this is also a broader recommendation—curriculum should be made relevant and interesting to students to spark their engagement, and this is true even if the curriculum is not personalized. One particularly appropriate place to align with student interests is in the selection of reading materials. Of course, reading materials still need to be appropriately challenging, and thus it makes sense for districts or states to identify a broad range of grade-level texts covering an array of topics and interests that teachers and parents can draw on. Culturally relevant and potentially controversial topics (in the public school setting) can be another focus of personalization—one respondent in the pod interviews noted using resources about gender identity, another about Black Lives Matter, and a third about students' religious backgrounds.

Given the above, and relating to the first recommendation, a key in providing homeschool/pod instructors with materials to support personalization is that these should be provided in ways that are not overly burdensome for the instructors to implement. Again, this likely means well established curriculum materials and digital resources with aligned and integrated assessments to track student performance and direct the provision of personalized curriculum opportunities. If individual pod or homeschool instructors are stuck with the task of personalizing traditional curriculum materials to the varied needs of each of their students, this will likely fail under the weight of having to figure out where students are at and then source corresponding materials—something that even trained, full-time teachers would struggle to provide.

RECOMMENDATION 3: TEACHERS NEED SUPPORT TO SUPPLEMENT MORE PRODUCTIVELY

The reality is that, whether traditional public schoolteacher or homeschool/pod teacher, nearly all teachers supplement the core curriculum, many to a great extent. Supplementation refers to any premeditated additive change teachers make to

their official curriculum materials (Silver, in press). As described above, virtually all traditional teachers supplement with materials they create or source from the internet (e.g., TeachersPayTeachers, Google, Pinterest); some teachers do this substantially. Interviewees from pod families vividly described the types of supplementation they do and the reasons they do it. Some of the supplementation was in service of personalization, but supplementation also served many other purposes (most of which are the same or similar to the purposes it serves for traditional classroom teachers; see Polikoff & Dean, 2019 for a discussion of common reasons teachers supplement).

Just as in the traditional classroom setting, one important fact about supplementation in the homeschool/pod setting is that it is often simply to fill time or perceived gaps in the core curriculum and provide additional opportunity for practice. For instance, one respondent noted "I created almost a year's worth. … I'm Supplementing to last to June 25th," and others noted the need to supplement to bolster the core materials that each child was using. As in traditional classrooms, homeschool/pod teachers use a wide range of different supplementation resources. Interviewees mentioned the major players—Google, Pinterest, and TeachersPayTeachers. But they also mentioned sourcing materials from their friends and colleagues who were traditional public school teachers, using old editions of textbooks, and even creating materials themselves from scratch. One pod teacher described the full array of sources:

> Do a lot of searching on Pinterest. I'm in a couple of homeschooling groups on Facebook … And just glean ideas from other parents that are posting, whether they be COVID homeschoolers or people that have been intending to do homeschooling.

> I'll buy, periodically, some resources from Etsy or Teachers Pay Teachers for stuff like teaching the alphabet. All of the boys have been very resistant to writing and a lot of fine motor things, so I've just been winging it and being creative.

These sources are in line with those used by traditional classroom teachers, and the interviews make clear that there is no one approach to supplementation—each teacher approaches supplementation differently based on their own characteristics/background and those of their students (for more on this, see Polikoff & Silver, 2021).

A third important fact about supplementation is that it seems especially prevalent in non-core subjects and for hands-on activities. For instance, one interview respondent noted that teacher-driven supplementation in her pod school was focused on things outside the "regular school curriculum," including social-emotional and culturally responsive materials. Another noted that she drew on supplemental materials for "enrichment" pulling from science experiments she had encountered in an International Baccalaureate primary school curriculum. This same respondent noted the need for hands on supplemental activities to "get out that extra energy … which I would not be able to do if it was a traditional setting." A third mentioned a "random mix of practical knowledge with technology, with finances … just fun things and even board games." A fourth mentioned drawing on the expertise of parents—carpenters, architects, and a music shop owner—to design enrichment activities for the children.

In many ways, then, the findings with regard to supplementation are similar whether teachers are in the pod/home school setting or traditional classrooms. And of course,

there is vanishingly little oversight of supplemental curriculum materials regardless of setting. Thus, similar recommendations to those made elsewhere may be appropriate (for more, see Polikoff, 2021). The goal will never be for teachers to forgo supplementation—it clearly serves important purposes, especially for differentiation and engagement. Rather, the goal should be for supplementation to be supported in productive ways. This likely means things like:

1. Creating repositories of high-quality, standards-aligned supplemental materials that instructors can trust.

2. Using supplemental materials to shore up the weaknesses of core materials.

3. Encouraging collaboration among instructors (homeschool/pod, traditional classroom, tutors, after school providers) in the use of supplemental materials, perhaps through the creation or strengthening of teacher networks.

4. Using supplemental materials especially to target issues of cultural relevance where traditional materials may fall short.

Discussion

Most of the structural curriculum challenges discussed here long predate the pandemic. But as schools were closed for in-person learning, many of the access issues were exacerbated. And as parents set about the task of providing instruction at home, the challenges became all the more apparent. This paper analyzed some of the key findings from existing literature about how to support educators, whether in the traditional classroom or in the homeschool/pod setting, in the area of curriculum. To summarize, the major recommendations are:

1. States and districts should ensure all teachers have access to high-quality core curriculum materials and the necessary technology to use them well. These materials should include both on- and off-grade content. In the homeschool/pod setting, if the child is associated with a particular district, the core materials should ideally be the same materials are as used in that district.

2. All teachers should be supported to personalize instruction in both level and content, ideally through adaptive curriculum materials that can do at least some of the work of targeting student need (in other words, the onus of personalizing cannot fall on the shoulders of every individual teacher—their jobs are hard enough already).

3. States and districts should support teachers to supplement productively by identifying sources of high-quality supplementals and supporting collaborative supplementation efforts.

These recommendations echo those discussed at greater length elsewhere (Polikoff, 2021); there, I also offer specific recommendations for district and state leaders who want to support better curriculum implementation. Emerging from the pandemic with strength and a forward-looking vision will require quality, coherent instructional approaches. Leveraging the potential power of curriculum materials is one way to increase the likelihood teachers will be able to address student learning disparities and propel students forward after COVID-19.

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About the Author

Dr. Morgan Polikoff is an Associate Professor of Education at the USC Rossier School of Education. He researches curriculum, standards, accountability, and assessment policy; public opinion on education; and the impact of COVID-19 on American families.

In 2021, he published his first book, Beyond Standards: The Fragmentation of Education Governance and the Promise of Curriculum Reform (Harvard Education Press). Recent work has investigated the adoption and use of curriculum materials to align with state standards and critiqued the design of standards-based policy systems. With Anna Saavedra, he co-directs the education portion of the nationally representative longitudinal Understanding America Study, which is tracking the impact of COVID-19 on American families' educational experiences and attitudes. He has published over 55 peer-reviewed journal articles and received (as PI or co-PI) more than $16 million in grants from federal and foundation sources. For his research achievements he received the AERA Early Career Award in 2017 and the AERA Outstanding Public Communication of Education Research Award in 2020. For his work with graduate students and postdocs he also received outstanding mentoring awards from USC Rossier and USC in 2018 and 2019, respectively.

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