RESEARCH REPORT

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The Impact of the Pandemic on Academic Support for Preschoolers: Key Takeaways from a New Jersey District-Level Survey

Milagros Nores & Erin Harmeyer
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About NIEER

The National Institute for Early Education Research (NIEER) at the Graduate School of Education, Rutgers University, New Brunswick, NJ, conducts and disseminates independent research and analysis to inform early childhood education policy.

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About the Authors

Milagros Nores, Ph.D. Dr. Nores is the co-director for research at the National Institute for Early Education Research (NIEER). Her expertise and interests are in early childhood development, data-driven policy development, evaluation design, equity, and English language learners. In her role, she oversees research operations, while pursuing her own research interests as well. Dr. Nores currently leads evaluations in Colombia (South America), West Virginia, New Jersey, Philadelphia, and Indiana.

Dr. Erin Harmeyer is an assistant research professor at the National Institute for Early Education Research (NIEER). Her research interests include early childhood development, caregiver-child interactions, and family childcare settings. At NIEER, she is currently working on evaluations of programs in Indiana, West Virginia, Philadelphia, and New Jersey.

Abstract

In March 2020, most preschool programs physically closed at the onset of the COVID-19 pandemic. For state-funded preschool programs, guidance differed in terms of what programs were required to provide to students. While some states mandated the provision of remote learning, others did not, and still others opted to provide alternative types of supports and resources to families (Friedman-Krauss et al., 2021). This brief reports on the responses of district leaders in one state that offers state-funded preschool (New Jersey) on how they supported preschool learning at the onset of the COVID-19 pandemic. Schools in New Jersey were closed to in-person instruction beginning March 18, 2020, and stayed closed for the remainder of the 2019-20 school year, requiring preschool programs to adapt instruction accordingly. The results highlight that while many children had access to or were encouraged to engage in activities like reading and music, participation rates varied critically, and the types of supports provided ranged in type, frequency, and duration. In addition, while close to two-thirds of districts provided professional development for teachers, much of this was centered on how to use the technology needed to reach children and families, rather than in developmentally appropriate practices or instructional strategies that could be used in the online environment. In addition, daily communication with children was absent in almost half of the districts, which means that remote learning occurred through a strong dependence on parents. While most districts rolled into the 2020-21 school year with more experience and preparation, looking back at the end of the 2019-20 school year provides an opportunity to reflect on lessons learned, on gaps in the opportunities provided, and on critical aspects to address moving forward.

Introduction

The COVID-19 pandemic has had a profound impact on schooling in the United States, and this is particularly true for preschool-age children. According to a survey conducted here at the National Institute for Early Education Research (NIEER), 71% of 4-year-old children attended a preschool program prior to the pandemic (Barnett & Jung, 2020). At the onset of the 2020-21 school year, preschool participation for 4-year-olds had fallen to 54%. Children in the lowest-income families had the lowest in-person preschool participation, with just 14% attending in-person school, as compared to 42% of all other children attending school in person. Similarly, a recent summary of research on early learning found learning challenges for children and families during remote or hybrid schooling throughout the pandemic resulted in less learning time and lower-quality instruction for young children, particularly for children of color, low-income children and dual-language learners (Weiland et al., 2021).

The landscape of education for 3- and 4- year-old children in the United States has always been a complex, mixed-delivery system, with many states providing preschool primarily in Head Start or childcare classrooms. In general, rates of preschool attendance have rapidly increased over the past decades. While less than one-half million children were enrolled in preschool programs in 1964, 50 years later that number had climbed to 4.7 million (Chaudry & Datta, 2017). Since 2002, NIEER has documented the changes in enrollment in state-funded preschool programs, and while progress has been made over time, it has recently stalled, with virtually no progress made in the past few years. For example, enrollment of 3- and 4- year-olds in state-funded preschool increased by one-tenth of one percentage point between the 2018-19 and 2019-20 school years (Friedman-Krauss et al., 2021). One concern with the downward trend in preschool attendance during the pandemic is that recent progress made towards enrolling more children in state-funded preschool programs will stagnate or reverse.

Understanding the state of preschool attendance in the United States, and thereby examining the pandemic's influence on it, is important because of the well-documented evidence of high-quality early learning experiences on children's development (Barnett, 2011; Camilli, et. al, 2010; Joo, et. al, 2020; McCoy, et. al, 2017). Well-designed, high-quality preschool programs have a long-standing impact on children's school success, leading to higher achievement scores, lower rates of grade repetition, and overall higher educational attainment, among other benefits (e.g., Barnett & Jung, 2021a; Gray-Lobe et al., 2021). Children from lower-income families and minoritized populations often benefit the most from high-quality preschool (Barnett, 2008; Yoshikawa, et al, 2013). That many children missed out on preschool at the onset of, and as the pandemic has continued, has important implications for children's academic preparedness as we look to this and subsequent school years.

The closure of schools also played a pronounced role on family life. As schools closed their doors in the spring of 2020, parents reported high levels of stress due to shifts to working from home and managing remote learning, and other essential workers tried to plan how to care for children while needing to work in-person themselves. According to a survey conducted in the early months of the pandemic with nearly 1,200 parents of 5- to 7- year-olds in the state of Massachusetts, more than 60% of parents agreed or strongly agreed that they felt nervous, anxious, or on edge about the pandemic (Gonzalez et al., 2020). In

addition, 92% of responding parents and guardians described major changes to their families' activities and routines.

As families shifted to all these changes in structure and family life, it became apparent that prioritizing children's learning would be difficult. While researchers have demonstrated that time engaged in educational activities at home (particularly educational time with parents) is positively associated with children's development (Fiorini & Keane, 2014; McCormick, et. al, 2020), the demands of working full-time and navigating virtual instruction proved difficult. For example, the CDC surveyed parents of children ages 5-12 between October and November of 2020 and found that, as compared to parents of children attending in-person school, parents of children receiving virtual instruction were more likely to report higher levels of emotional distress, conflict between working and providing childcare, and difficulty sleeping (Verlenden et al., 2021). Thus, as familiar roles and routines were shifted for the majority of families during the pandemic, stress levels increased, likely impacting the capacity parents felt they had for supporting virtual instruction.

Finally, preliminary evidence shows school closures have impacted children's learning opportunities and academic outcomes. Struggles were reported at both the teacher and child level. For example, in a survey with 1,828 lead teachers and co-teachers in the state of Virginia who worked with 3- to 5- year-old children, just 58% reported they were able to teach/interact with children effectively online, and 67% reported that children enjoyed the virtual lessons (Bassok et al., 2021). Likewise, in a survey of 717 districts serving the elementary grades, researchers found that 85% of districts expected instructional time to drop below four hours of instruction per day, representing a loss of at least 20% in instructional time per day (Rickles et al., 2020). These losses in instructional time have translated to losses in academic outcomes: For example, in one study of kindergarten through second grade students attending 78 public and charter schools in Washington, D.C., 12% fewer students were proficient in reading in the fall of 2020 as compared to in the fall of 2019, and drops in early literacy proficiency were more likely for students categorized as at-risk (EmpowerK12, 2020).

Background

Understanding the types of alterations to instruction that were made at the onset of the pandemic for preschoolers and how these could have impacted children's learning requires understanding the types of learning environments that research shows best support children at this age. There are characteristics of high-quality preschool programs that have been found to optimally support children's development. Examples of these elements of a high-quality preschool environment include warm and positive teacher-child relationships (Pianta & Stuhlman, 2004); teachers who are competent in implementing developmentally appropriate practices (Meloy & Schachner, 2019); and a developmentally-appropriate curriculum that supports children's learning (Raver et al., 2009). Other indicators of quality include inputs such as highly-trained teachers, low staff-child ratios and the program's participation in a continuous quality improvement system (Friedman-Krauss et al., 2021).

Researchers have also found cognitive benefits related to other types of activities provided in preschool programs. Opportunities for imaginative play and creativity are important for cognitive development: For example, Walker and a team of researchers (2020) found that children showed improved executive function skills after partaking in a 10-week preschool

intervention in which they created and developed an imaginary world with their teacher. Informal music activities (including singing, dancing, listening to recorded music, and musical play at school or at home) may improve neurocognitive functions and are thus important activities in a preschool classroom (Putkinen et al., 2013). Opportunities for children to engage in self-initiated activities, and to explore concrete materials, have long been recognized as important components of developmentally appropriate practice in early childhood (Stipek et al., 1995). Finally, there has been increasing recognition of the importance of activities that support unconstrained skills (e.g. reading) over activities focused on constrained skills (e.g. letter recognition; McCormick et al., 2020).

An important question for districts as schools shut down in the spring of 2020 was how to replicate these types of educational experiences (e.g., opportunities for play, music and the use of concrete materials; and supporting literacy skills and relationship building) for children at home. Many educators reported a lack of professional development, support, or training in providing virtual instruction for children. For example, educators in Colorado identified that while they had access to proper technology, they needed additional training on how to actually use the curriculum and materials provided to adequately support children's learning (Delap et al., 2021). Understanding the comfort level of districts to provide activities that would be considered typical to a preschool classroom was an important question in this research.

Another component of preschool learning is digital media usage: The National Association for the Education of Young Children reports that technology and media can be effective preschool classroom tools when used to support learning goals in an intentional manner, with co-viewing happening between adults and children (NAEYC & The Fred Rogers Center, 2012). However, researchers have also long demonstrated that heavy screen usage during early childhood has been associated with negative outcomes in domains including cognitive development and attentional focus, and that heavy screen usage links to higher rates of externalizing problems, among other issues (Tanimura et al., 2007; Tamana et al., 2019; Vandewater et al., 2005).The American Academy of Pediatrics thus recommends limiting screen time to 1 to 2 hours of quality programming during the day for preschoolers (American Academy of Pediatrics, 2016).

Yet during the pandemic, children's screen media usage increased. For example, a small scale time usage study conducted with preschool, kindergarten and first grade parents at the onset of the pandemic found that the most universal daily experience for children was passive screen time, with children spending up to 10 hours per day engaged in this type of activity (Nores, 2020). Likewise, in a survey of Massachusetts parents, the majority reported that their 5-to-7-year-old children were watching more television and movies during the pandemic than they had in years prior (Gonzalez et al., 2020). Not only were children increasing their screen time usage because they were spending more time at home, but with many children engaged in virtual instruction, time on screens also increased because of the need to complete school assignments on the computer.

A final consideration when looking at the positive impacts of preschool learning is dosage: The amount of time children spend in classroom instruction is typically positively related to academic outcomes. One international meta-analysis demonstrated that programs lasting 1-3 years had larger impacts on children's outcomes than programs that lasted less than one year (Barnett & Nores, 2010). Likewise, in a longitudinal study of tenth grade outcomes for

children enrolled in the Abbott Preschool Program in New Jersey, researchers demonstrated that two years of pre-K beginning at age 3 has roughly twice the effects on achievement outcomes as completing just one year of pre-K beginning at age 4 (Barnett & Jung, 2021a). Finally, in a study of 4-year-olds enrolled in public preschool in Chicago Public Schools, researchers found that children who missed the most days of school during the year had lower levels of kindergarten readiness at year-end as compared to children who missed fewer days of school (Ehrlich et al., 2014). An important consideration heading into the next school year, then, is that absenteeism may have been high for children in both in-person and virtual environments, due to engagement with remote learning and if children had to miss in person school days due to quarantine.

Understanding the rates of participation in virtual supports will help districts gain a sense of where preschool children may be at after more than a year of altered learning environments. Early in the pandemic, a survey of school districts found the support provided by remote schooling to be highly variable in daily duration and content (Rickles et al., 2020). Another survey of school districts in Colorado administered early in the pandemic demonstrated that districts felt more prepared to support early elementary (K-2) learners and high school seniors than they did to support learners in prekindergarten (Colorado Department of Education, 2020). Based on this preliminary evidence that districts demonstrated variable capacities to support learners, particularly in early childhood classrooms, this research sought to learn more about district-level responses to the pandemic.

The NIEER District Study

As the pandemic disrupted classrooms across the world, we wanted to understand how preschool classrooms in the state of New Jersey were being impacted. Our goal was to learn from district leaders about their attempts to respond to new health and safety concerns brought forth by the pandemic while still providing services for preschool-age children. Our research questions were:

1. How did state-funded preschool programs in the state of New Jersey respond to the COVID-19 crisis in the months immediately following the onset of the pandemic?
2. What types of supports did district leaders report they and teachers were receiving, and did teachers and leaders feel those supports were adequate in addressing the needs of children?
3. What types of experiences and supports were districts providing for preschool children, and how frequently were families engaging with those supports? To what degree were families and children engaging with these experiences provided?

The NIEER Covid-19 district study provides details on district responses for a sample of 65 out of 194 publicly-funded New Jersey districts implementing the state's preschool program (32% were districts formerly known as Abbott, 11% ECPA or ELLI funded, 46% PEEA funded and 11% PEG funded[1]). The small sample does not support making inferences on

[1] Abbott districts refer to the 31 high poverty districts that were mandated to offer universal preschool as part of the Abbott landmark decision. ECPA refers to districts formerly known as Early Childhood Program Aid. ELLI refers to Early Launch to Learning Initiative. PEEA refers to Preschool Expansion Aid districts. PEG refers to Preschool Expansion Grant districts. See https://nj.gov/education/ece/psfunding/Abbott.htm.

how all districts operated in New Jersey. This study is exploratory and intended to provide additional perspectives on the learning experiences of children at the onset of the pandemic.

Findings

Supports to teachers

In terms of supports for teachers, we found that just 69% of districts reported providing professional development (PD) to preschool teachers to support the transition to remote schooling. Of those that did report providing PD, the most commonly reported form of PD offered was digital training, such as supporting teachers in the usage of Google Classroom, Zoom or Screencastify (41% offered this). Just 25% of those offering PD reported offering trainings on curriculum, and 16% reported offering training on communicating with families and parents.

When asked whether or not teachers were provided with specific activities to use in their teaching, such as lesson plans or links to online activities, the majority (94%) reported providing this type of support to teachers. In breaking down what exactly districts provided to teachers, approximately half reported providing curricular resources or tools provided by the developers of the curriculum, and about one-third reported providing digital resources (e.g., instructional videos or a virtual learning platform with daily tasks). Fewer administrators (12%) reported using a Master Teacher or curriculum supervisor to supply or help develop lesson plans with or for teachers. Those that did provide this type of support seemed to recognize the difficulty of pivoting instruction to a new online environment. For example, one administrator stated that supports provided were *"(w)eekly lesson plans put together by EC Supervisor, Master Teachers, and PIRT [preschool intervention and referral team] as a way of uniformity for this unknown, challenging experience."*

Supports received from the district and/or state were also variable, with about half of districts mentioning general resources they were provided from the state, such as state guidelines, a Zoom call with state officials, or links to resources. For example, one administrator stated: "*Our DOE point person has sent resources and suggestions to me, which I funnel to the teachers. District has a curriculum supervisor, as well. We are small which allows frequent contact."*

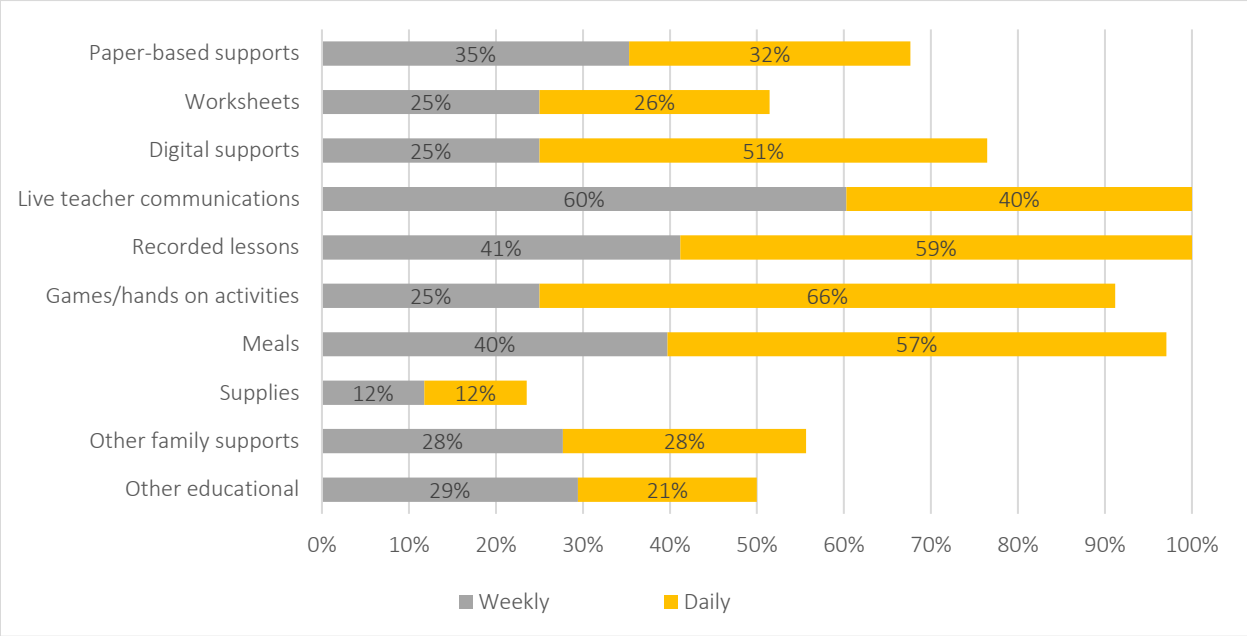
Finally, connectivity differences between teachers and families were evident between district type. Just 62% of district leaders in Abbott districts reported that more than 95% of teachers in their district were able to connect digitally with families to provide supports for remote schooling; in contrast, 95% of leaders in PEG, PEEA and ECPA districts reported this level of connectivity between teachers and families.

Supports and activities to families and children

The types of supports provided to families and children were heavily skewed towards asynchronous/material types of supports. When asked which supports districts provided for children enrolled in pre-K and whether these were provided weekly or daily, the most common support offered daily was games/hands-on activities (66%), followed closely by

recorded lessons (59%) and meals (57%). Less frequently provided daily were live teacher communications (40%). Supplies were rarely provided at a daily or weekly basis (22%).

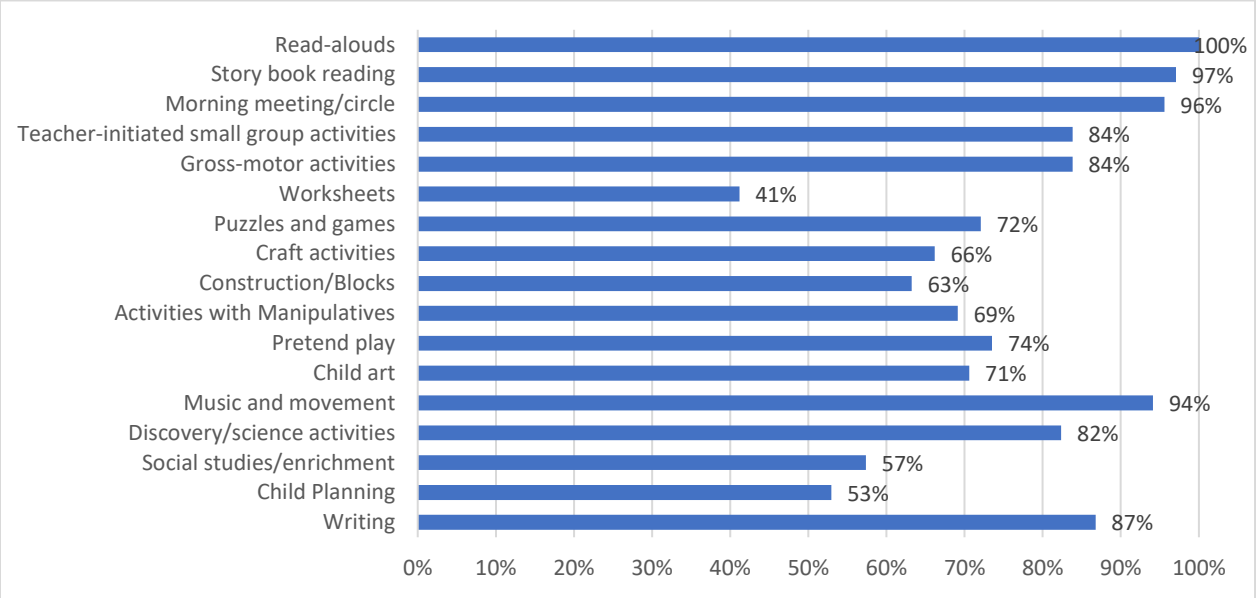
Which of the following supports have you provided for children who were enrolled in pre-K? Weekly or Daily.



*Note: In other family supports, of those districts reporting, 48% reported supports directly to families that focused on their well-being and counseling. In other education supports, districts reporting providing these mostly mentioned PIRT or IEP supports (53%).

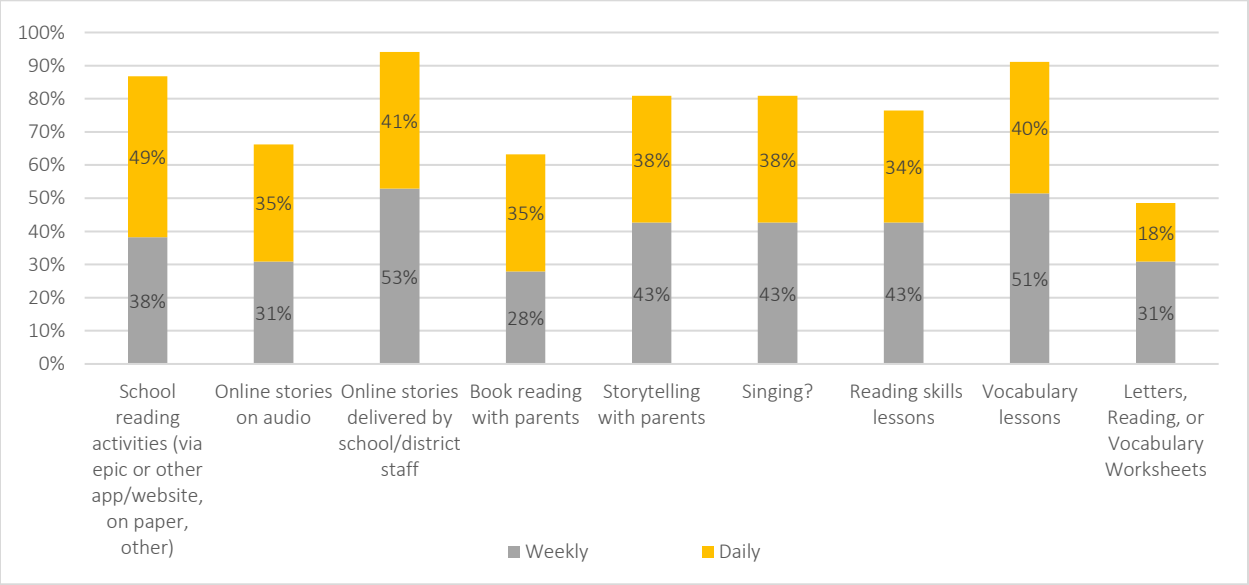
We also found that district leaders reported that most children were regularly being provided with a variety of the types of activities that they would be exposed to in an in-person classroom setting. We asked district leaders to report what types of support they provided regularly (either live, on video, or by asking parents to provide those supports). In relation to materials and learning supports to families, all districts reported that children were regularly being provided with read alouds, with another 96% reporting morning meetings, 94% reporting music and movement, and 84% reporting gross motor activities. These activities are typical of a preschool day, and the widespread provision of these, either through live support on video, or by asking parents to provide this type of support, is encouraging. In contrast, over 40% of districts reported regular use of worksheets.

Which components have you provided regularly either live, on video or by asking parents to provide the support?



However, when pressed further to describe language and literacy activities the districts included and with what frequency, our findings indicate that many children were not receiving support for language, literacy and gross motor activities at the level they would were in-person instruction occurring (i.e., on a daily basis). For example, less than half of districts reported providing school reading activities (via EPIC, another app/website, or on paper) or online stories daily; and approximately one-third of districts reported providing online audio stories, reading skills lessons, or book reading with parents daily. Yet reading and online stories were more frequent than most other language and literacy activities.

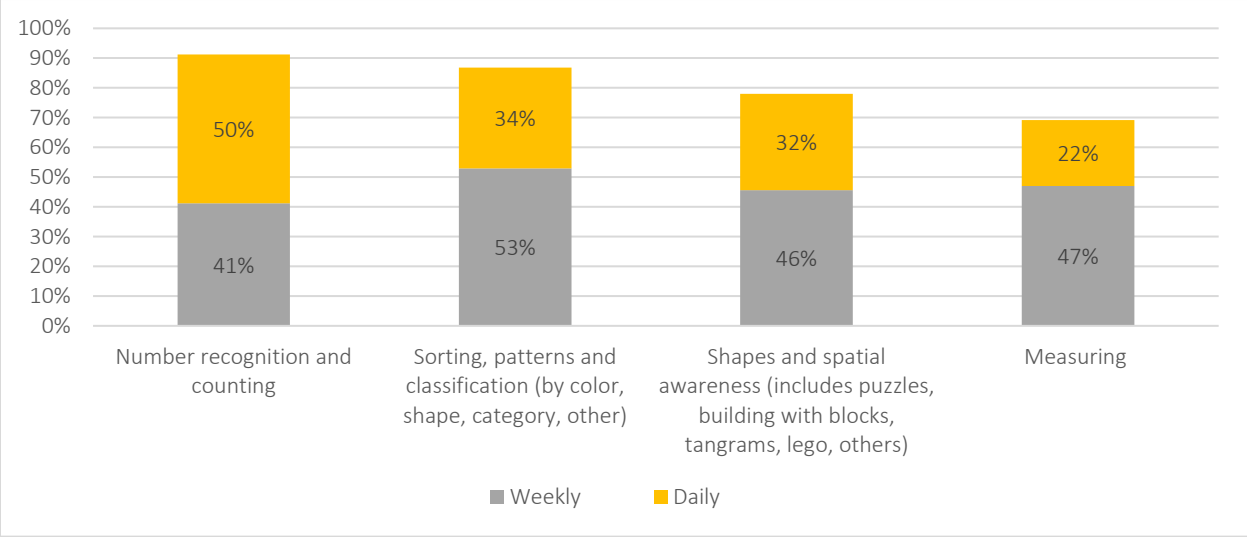
Which of the following language and literacy activities has your district included, and with what frequency?



Districts described school reading activities as including a combination of teacher read alouds and online resources (e.g., online curated resources such EPIC, YouTube, Storyonline, Spanishexperiment, Scholastic Reads, Vook, or prerecorded read alouds by school staff). Districts reported that in order to support parents in reading with children, they supplied mystery readers, provided resources on how to read, and encouraged parents to read with their children. While worksheets were sometimes mentioned as examples of activities supporting language and literacy, some districts did emphasize not using worksheets, and it seems only a few defaulted to worksheets on a daily basis. As one district mentioned, *"We do not provide worksheet but rather activities for parents to engage in reading and vocabulary teaching based on hands-on activities."* However, about half of the districts did report using them on a weekly to daily basis.

Finally, districts reported engaging children in STEM activities less frequently than in other types of activities. For example, approximately one-third of districts reported engaging children daily in unconstrained skill activities with shapes and spatial awareness (such as puzzles, building with blocks, or Legos), and in sorting, patterns, and classification activities. Yet fifty percent of districts reported engaging children in number recognition (a constrained skill) and counting activities on a daily basis.

Which of the following STEM skills has your district included in the provided activities and with what frequency?



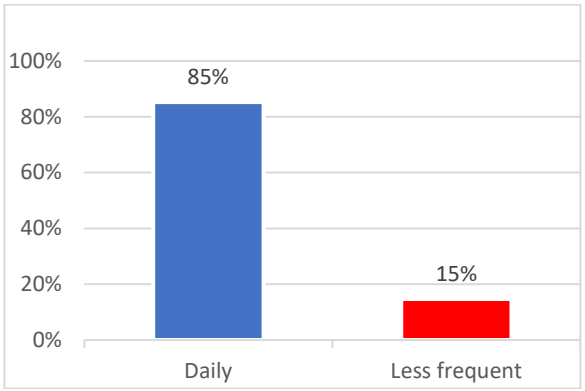
Among these STEM categories, districts described activities on one-to-one correspondence, counting with purpose, math games, worksheets, number hunt, number recognition, sorting, patterns, Legos, building, shapes drawing or hunting, and measuring activities.

Communication & Engagement

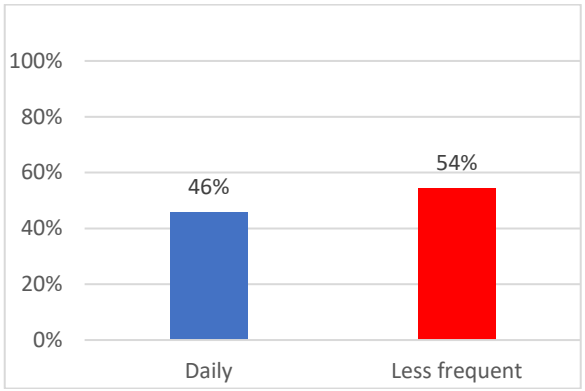
While districts reported that they were communicating frequently with parents, we found that communicating with parents directly occurred more frequently than communicating with children. When asked how often they communicated with parents in any form, 85% of districts reported communicating daily with parents in some form (e.g., phone, Zoom or other conferencing platform), and 15% reported communicating with parents less frequently than this. However, when asked how often they communicated with children, just 46% of districts reported doing this daily, while 54% of districts reported less frequent

communication with children. This confirms that one of the main effects of shifting towards remote learning was a shift towards depending on parents to support their children, without necessarily being able to provide teaching and learning services directly to children.

Percentage of daily communication by teachers with parents in any form?

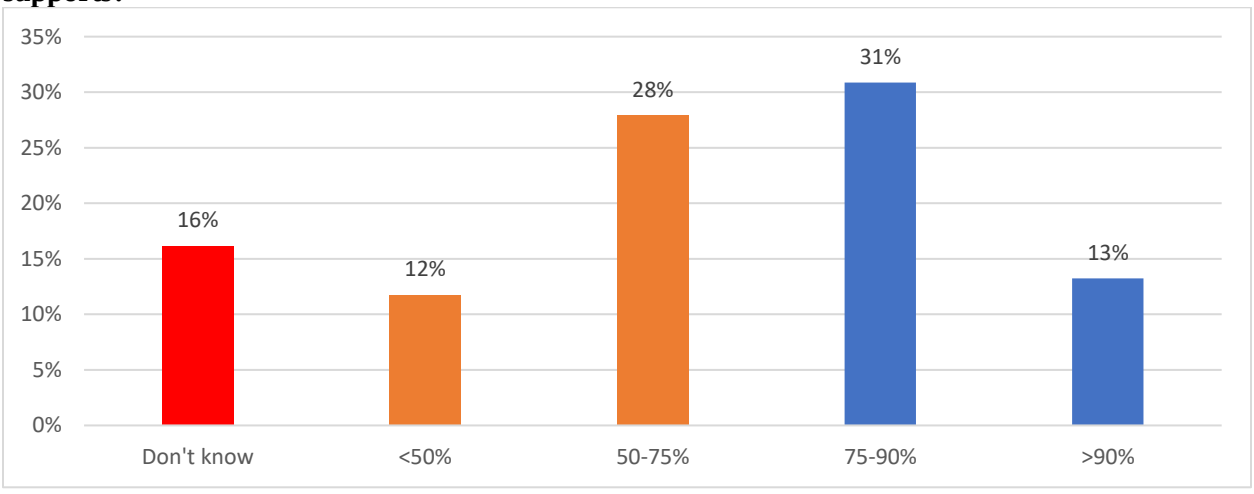


Percentage of daily communications by teachers or district staff with the children in any form?



Although districts reported frequently communicating with parents, they also reported that many children and families did not regularly engage with virtual instruction. When asked what percentage of parents engaged regularly with the provided supports, just 13% of districts reported that greater than 90% of parents regularly engaged. In contrast, 28% of districts reported about half to three fourths of parents engaged with supports regularly, another 12% reported that less than half of parents engaged with the supports regularly and 16% reported not really knowing.

Approximately, what percentage of your parents have engaged regularly with the provided supports?



What did and did not work

By far the most commonly reported challenge for districts in the early stages of the pandemic was related to parental (and therefore child) engagement and participation. While this is reflected in the numbers above, administrators also provided qualitative feedback

about challenges that demonstrated struggles with family engagement. For instance, one administrator stated:

> *"The most challenging part is not being able to meet with them daily via zoom or facetime since it is a District restriction. Preschool teachers would love to have that live instruction because interactions are needed to teach in preschool. Another challenge has been helping parents to understand how to use technology devices to receive daily instruction and communicate frequently with teachers."*

Along with these struggles for engagement was the discrepancy some administrators felt between their knowledge of developmentally appropriate practice for children (e.g., time for play, limited technology usage, a developmentally appropriate curriculum) and the constraints to providing these practices that are presented when teaching in an online environment. Another administrator stated:

> *"Preschool requires hands-on activities, intentional play, and consistent communication (student-student, student-teacher). Many parents have had to do their own work and help their children. Many have opted to allow their children to use electronic devices for extended periods of time."*

Administrators felt most successful and effective in navigating the early challenges of the pandemic when they were able to maintain communication with parents and use available digital platforms effectively. However, when asked to describe one or two elements of their approach (things they actually provide) that have been successful, roughly two-thirds of responses described mostly asynchronous mechanisms of engaging children and families. Examples of these included providing supports like a classroom Facebook page, instructional packets, links to resources on district websites, and links to a YouTube channel with teacher read alouds. Few responses mentioned monitoring attendance or engagement rates. While it seems that many administrators recognized the importance of providing synchronous content or interaction with children, limitations either at the district level or due to connectivity issues often prevented this type of instruction and support. Additionally, it seems few districts focused on tracking attendance, and the previously mentioned rates of low engagement amongst many families is cause for concern.

Discussion

This brief provides a summary of efforts made by districts to modify instruction for preschoolers in the months following the onset of the COVID-19 pandemic. We found that a majority of district leaders reported that they themselves or parents were being encouraged to regularly provide activities typical of a preschool day, including read alouds, music and movement activities, and gross motor activities. Additionally, we found that districts reported communicating with parents frequently – with 85% of districts reporting daily communication with parents, either via Zoom or other videoconferencing platform, email, or another method. Finally, districts also reported that STEM activities were being somewhat included as part of the provided activities – for example, 50% of districts reported providing number recognition and counting activities daily.

Of note in our findings is that although a majority of districts reported regularly providing support for activities such as read alouds, music, and movement activities, when asked further about the frequency in which they were providing these activities, most were

occurring on a weekly rather than daily basis. For example, while 41% of districts reported providing online stories delivered by school/district staff daily, another 53% reported that the frequency of providing this activity was weekly. As read alouds are part of most typical preschool days, it is clear the onset of the pandemic altered instruction in ways that are likely to have impacts on children's learning. Researchers have demonstrated that shared story book reading is an effective way to encourage print awareness, emergent literacy, and vocabulary development for preschoolers, and this is particularly true for low-income children (Justice & Ezell, 2002; Lefebvre et al., 2011; Noble et al., 2019); providing this activity at a lower frequency is likely to impact children's literacy development.

Furthermore, while most districts reported communicating with parents daily, direct communication between teachers and children did not occur as often. Less than half (46%) of districts reported that children were being communicated with daily in any form. The fact that this communication more frequently occurred between parents and teachers/districts rather than between children and teachers/districts confirms what we suspected, that preschool-age children needed a heavy level of scaffolding and support to pivot to virtual learning after becoming accustomed to an in-person learning environment. However, this shift in responsibility likely came at a cost to parental well-being: another NIEER study showed that almost half of parents of preschool-age children who were engaged in virtual instruction reported feeling overwhelmed, and an additional 23% felt moderately overwhelmed (Barnett & Jung, 2021b).

It seems that this reliance on parents to communicate much of the information between districts and children and these high rates of parental overwhelm may have links to the low reported participation rates of families engaging with provided supports. While 13% of districts did report that the majority of their families (>90%) engaged regularly with the supports, this leaves a large proportion of districts reporting that more than 10% of families were not regularly engaged, and 12% of districts even noted that less than half of families were engaging regularly with supports. If regular engagement with virtual instruction can serve as a proxy for attendance, it is clear that for the districts in our sample attendance rates suffered as a result of the pandemic. If these children were engaging at a similar rate as chronicly absent children typically do, this can be interpreted as about half the children being chronically absent. These findings align closely with a study conducted at NIEER in the fall of 2020, where we found that the majority of preschool-age children participated less than once a week in remote preschool-provided learning activities such as book reading and singing or listening to music (Barnett et al., 2020), providing further evidence that although most districts reported providing supports for children, participation rates were variable, and many children did not partake. Furthermore, evidence suggests that children from historically marginalized groups were at greater risk of experiencing learning setbacks during the pandemic (Domingue et al., 2021). Districts should pay close attention to the results of chronic absenteeism, with a particular eye on learning loss for historically marginalized children, as instruction begins again in the fall of 2021 with some children likely being required to quarantine and therefore be served remotely.

We also found that supports for children and families leaned towards material and asynchronous types of supports, with the most commonly offered daily supports for families being games/hands-on activities, recorded lessons, and meals (57%). Providing meals, material supports or asynchronous lessons that could be viewed at a family's convenience

were all important and necessary resources for families, but many districts leaned heavily on this type of support for families, which left children lacking in the types of synchronous interactions with their caregivers and peers that are critical in the preschool years. The early grades are a particularly important timeframe for the development of not just academic but also social skills in which children are learning to collaborate with others through play and hands-on activities (Blair et al., 2018). The online environment made this challenging. As one administrator stated: *"Participation for long periods of time virtually is not developmentally appropriate for young children. Keeping them engaged and learning through play is more challenging virtually. Also not all children have the same materials at home."*

Although we analyzed data collected from just a small number of district leaders in one state, our findings reinforce what others have found about the impact of the pandemic: Namely, that many changes to instruction were made for preschool-age children that prioritized health and safety, but that did not optimally serve academic and social skills development (Weiland et al., 2021). As was noted in one nationally representative study, just 10% of 3-to-5-year-old children were able to continue their education in the same program on the same schedule as prior to the pandemic (Barnett et al., 2020). These disruptions to learning were significant, and preliminary data of kindergarteners captured in the fall of 2020 show an increase of children at risk for reading failure and "not on track" for reading success in 3rd grade as compared to children who began kindergarten in 2019 (McGinty et al., 2021; Ohio Department of Education, 2020). More research needs to be conducted regarding the impacts of pandemic learning disruptions on children's outcomes. Furthermore, districts will need to look closely at how best to support children, a greater number of whom may be at risk due to loss of instructional time and support. Finally, further research is needed regarding the recovery of programs, and district leaders will need to be consulted regarding what is working and where support is still needed.

References

American Academy of Pediatrics. (2016). Media and young minds. *Pediatrics.* http://doi.org/10.1542/peds.2016-2591

Barnett, W. S. (2008). Preschool education and its lasting effects: Research and policy implications. Boulder and Tempe: Education and Public Interest Center & Education Policy Research Unit. Available at http://epicpolicy.org/publication/preschool-education.

Barnett, W. S. (2011). Effectiveness of early educational intervention. *Science*, 333(6045), 975-978. https://doi.org/10.1126/science.1204534

Barnett, W.S., & Jung, K. (2020). Understanding and responding to the pandemic's impacts on preschool education: What can we learn from last spring? New Brunswick, NJ: National Institute for Early Education Research. http://nieer.org/research-report/nieer-2020-preschool-learning-activities-survey

Barnett, W. S., & Jung, K. (2021a). Effects of New Jersey's Abbott preschool program on children's achievement, grade retention, and special education through tenth grade. *Early Childhood Research Quarterly, 56(3),* 248-259. https://doi.org/10.1016/j.ecresq.2021.04.001

Barnett, W. S., & Jung, K. (2021b). Seven impacts of the pandemic on young children and their parents: Initial findings from NIEER's December 2020 preschool learning activities survey. National Institute for Early Education Research. https://nieer.org/wp-content/uploads/2021/02/NIEER_Seven_Impacts_of_the_Pandemic_on_Young_Children_and_their_Parents.pdf

Barnett, S., Jung, K., & Nores, M. (2020). Young children's home learning and preschool participation experiences during the pandemic. National Institute for Early Education Research. https://nieer. org/wp-content/uploads/2020/11/NIEER_Tech_Rpt_July2020_Young_Childrens_Home_Learning_and_Preschool_Participation_Experiences_During_the_Pandemic-AUG2020.pdf.

Barnett, W. S., & Nores, M. (2010). Benefits of early childhood interventions across the world: (Under) investing in the very young. *Economics of Education Review, 29(2*), 271–282. https://doi.org/10.1016/j.econedurev.2009.09.001

Bassok, D., Weisner, K., Markowitz, A. J., & Hall, T. (2021). *Teaching young children during COVID-19: Lessons from early educators in Virginia*. University of Virginia. https://files.elfsight.com/ storage/022b8cb9-839c-4bc2-992e-cefccb8e877e/dae25999-c671- 46a7-a1e2-375354fa5e0b.pdf

Blair, C., McKinnon, R. D., & Daneri, M. P. (2018). Effect of the tools of the mind in kindergarten program on children's social and emotional development. *Early Childhood Research Quarterly, 43*, 52–61. https://doi.org/10.1016/j.ecresq.2018.01.002

Camilli, G., Vargas, S., Ryan, S., & Barnett, W. S. (2010). Meta-analysis of the effects of early education interventions on cognitive and social development. *Teachers college record,* 112(3), 579-620.

Chaudry, A., & Datta, A. R. (2017). The current landscape for public pre-kindergarten programs. *The Current State of Scientific Knowledge on Pre-Kindergarten Effects* (pp. 5–18). https:// www.brookings.edu/wp-content/uploads/2017/04/duke_prekstudy_final_4-4-17_hires.pdf

Colorado Department of Education (2020, April 17). *Colorado school district needs inventory.* Colorado Department of Education. https://www.cde.state.co.us/communications/needsinventory-results

Delap, S., Franko, M., Nicolaou, K., Silva-Padron, G., & Thornton, C. (2021). *Measuring the impact of COVID-19 on Colorado's early care and learning sector.* Early Milestones Colorado. https://earlymilestones.org/wp-content/ uploads/2021/03/COVID-Wave-1-Report-Web.pdf

Domingue, B. W., Hough, H. J., Lang, D., & Yeatman, J. (2021). Changing patterns of growth in oral reading fluency during the COVID-19 pandemic. Policy Analysis for California Education (PACE). https://edpolicyinca.org/publications/changing-patterns-growth-oral-reading-fluency-during-covid-19-pandemic.

Ehrlich, S. B., Gwynne, J. A., Stitziel Pareja, A., Allensworth, E. M., Moore, P., Jagesic, S., Sorice, E. (2014). Preschool attendance in Chicago public schools: Relationships with learning outcomes and reasons for absences: Chicago, IL: University of Chicago Consortium on Chicago School Research.

EmpowerK12 (2020, December). *COVID-19's impact on student well-being.* https://www.empowerk12.org/research-source/covid-student-wellbeing

Fiorini, M., & Keane, M. P. (2014). How the allocation of children's time affects cognitive and noncognitive development. *Journal of Labor Economics, 32(4),* 787-836.

Friedman-Krauss, A. H., Barnett, W. S., Garver, K. A., Hodges, K. S., Weisenfeld, G. G. & Gardiner, B. A. (2020). The State of Preschool 2019: State Preschool Yearbook. New Brunswick, NJ: National Institute for Early Education Research. http://nieer.org/state-preschool-yearbooks/2019-2

Gonzalez, K. E., Hanno, E. C., Cuartas, J., Jones, S. M., Lesaux, N. K., Hofer, K., Checkoway, A., & Goodson, B. (2020). *How are they faring? Impacts of the COVID-19 pandemic on the lives of families and young children in Massachusetts*. Saul Zaentz Early Education Initiative, Harvard Graduate School of Education. https://zaentz. gse.harvard.edu/wp-content/uploads/2020/08/ELS@H-COVID-Report_-Parents_Final_2.pdf.

Gray-Lobe, G., Pathak, P. A., & Walters, C. R. (2021). *The long-term effects of universal preschool in Boston.* (NBER Working Paper No. 28756). National Bureau of Economic Research. https://www.nber.org/papers/w28756

Joo, Y. S., Magnuson, K., Duncan, G. J., Schindler, H. S., Yoshikawa, H., & Ziol-Guest, K. M. (2020). What works in early childhood education programs?: A meta–analysis of preschool enhancement programs. *Early Education and Development, 31(1*), 1-26.

Justice, L. M., & Ezell, H. K. (2002). Use of storybook reading to increase print awareness in at-risk children. *American Journal of Speech-Language Pathology, 11(1),* 17-29. https://doi.org/10.1044/1058-0360(2002/003)

Lefebvre, P., Trudeau, N., & Sutton, A. (2011). Enhancing vocabulary, print awareness, and phonological awareness through shared storybook reading with low-income preschoolers. *Journal of Early Childhood Literacy, 11(4),* 453-479. doi:10.1177/1468798411416581

McCormick, M. P., Weissman, A. K., Weiland, C., Hsueh, J., Sachs, J., & Snow, C. (2020). Time well spent: Home learning activities and gains in children's academic skills in the prekindergarten year. *Developmental Psychology, 56(4), 710–726*

McCoy, D. C., Yoshikawa, H., Ziol-Guest, K. M., Duncan, G. J., Schindler, H. S., Magnuson, K., ... & Shonkoff, J. P. (2017). Impacts of early childhood education on medium-and long-term educational outcomes. *Educational Researcher, 46(8),* 474-487.

McGinty, A.S., Gray, A., Herring, W., Soland, J., & Partee, A. (2021). *Examining early reading skills in the wake of COVID-19: Virginia Fall 2020 state-wide screening findings and implications*. PALS Office at the University of Virginia. https://pals.virginia.edu/pdfs/download/ PALS_Fall2020_Findings.pdf.

Meloy, B. & Schachner, A. (2019). *Early childhood essentials: A framework for aligning child skills and educator competencies.* Palo Alto, CA: Learning Policy Institute.

National Association for the Education of Young Children & Fred Rogers Center. (2012). Technology and interactive media as tools in early childhood programs serving children from birth through age 8. Joint position statement. Retrieved from http://www.naeyc.org/files/naeyc/file/positions/PS_technology_WEB2.pdf

Noble, C., Sala, G., Peter, M., Lingwood, J., Rowland, C., Gobet, F., & Pine, J. (2019). The impact of shared book reading on children's language skills: A meta-analysis. *Educational Research Review, 28(2019),* Article 100290. 10.1016/j.edurev.2019.100290

Nores, M. (2020). Time Diary Estimates of young children's experiences during COVID-19 in New Jersey. New Brunswick, NJ: National Institute for Early Education Research.

Ohio Department of Education (2020). *Data insights: How the pandemic is affecting the 2020-2021 school year*. Ohio Department of Education. http://education.ohio.gov/Topics/Reset-and-Restart/ Data-Insights-on-the-2020-2021-School-Year.

Pianta, R. C., & Stuhlman, M. W. (2004). Teacher-child relationships and children's success in the first years of school. *School Psychology Review, 33(3),* 444-458.

Putkinen, V., Saarikivi, K. & Tervaniemi, M. (2013). Do informal music activities shape auditory skill development in preschool-age children? *Frontiers in Psychology, 4(572), 10.3389/fpsyg.2013.00572*

Raver, C. C., Jones, S. M., Li-Grining, C., Zhai, F., Metzger, M. W., & Solomon, B. (2009). Targeting children's behavior problems in preschool classrooms: A cluster-randomized controlled trial. *Journal of Consulting and Clinical Psychology, 77(2), 302–316.* doi:10.1037/a0015302

Rickles, J., Garet, M., Neiman, S., & Hodgman, S. (2020). *Approaches to remote instruction: How district responses to the pandemic differed across contexts.* American Institute for Research. https://www.air.org/sites/default/files/COVID-Survey-Approaches-to-Remote-Instruction-FINAL-Oct-2020.pdf

Stipek, D. J., Feiler, R., Byler, P., Ryan, R., Milburn, S., & Salmon, J. M. (1995). Good beginnings: What difference does the program make in preparing young children for school. *Journal of Applied Developmental Psychology, 19(1),* 41-66.

Tamana, S.K., Ezeugwu, V., Chikuma, J., Lefebvre, D.L., Azad, M.B., Moraes, T.J., et al. (2019). Screen-time is associated with inattention problems in preschoolers: Results from the CHILD birth cohort study. *PLoS ONE, 14(4): e0213995. https://doi.org/10.1371/journal.pone.0213995*

Tanimura, M., Okuma, K., & Kyoshima, K. (2007). Television viewing, reduced parental utterance, and delayed speech development in infants and young children. *Archives of Pediatric and Adolescent Medicine, 161(6),* 618-619.

Vandewater, E. A., Bickham, D. S., Lee, J. H., Cummings, H. M., Wartella, E. A., & Rideout, V. J. (2005). When the television is always on: heavy television exposure and young children's development. *American Behavioral Scientist, 48*(5), 562–577.

Verlenden, J. V., Pampati, S., Rasberry, C., Liddon, N., Hertz, M., Kilmer, G., ... & Either, K. A. (2021). Association of children's mode of school instruction with child and parent experiences and well-being during the COVID-19 Pandemic—COVID Experiences Survey, United States, October 8–November 13, 2020. Morbidity and Mortality Weekly Report, 70, 369-376. https://doi.org/10.15585/mmwr.mm7011a1

Walker, S., Fleer, M., Veresov, N., & Duhn, I. (2020). Enhancing executive function through imaginary play: A promising new practice principle. *Australasian Journal of Early Childhood, 45(2),* 114-126. https://doi.org/10.1177/1836939120918502

Yoshikawa, H., Weiland, C., Brooks-Gunn, J., Burchinal, M. R., Espinosa, L. M., Gormley, W. T., ... & Zaslow, M. J. (2013). Investing in our future: The evidence base on preschool education. Society for Research in Child Development.