



COLLEGE OF  
INFORMATION  
STUDIES



THE UNIVERSITY OF  
CHICAGO

# Challenges and Opportunities Using Technology in the Classroom

*Results From Focus Groups With Elementary School Teachers  
November 2021*

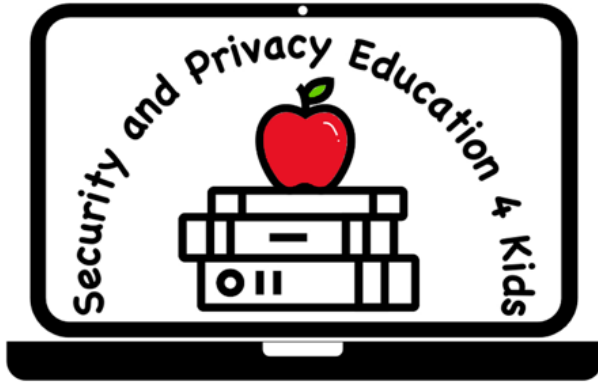


Paper produced by the Security and Privacy Education 4 Kids (SPE4K) research team.  
<https://SPE4K.umd.edu>

# Table of Contents

About the Project	3
About the Research Team	4
Executive Summary	5
Main Report	7
1. Introduction	7
2. Data Collection	8
3. Key Findings	10
3.1 Teacher Definitions and Concerns	10
3.2 Current Teaching Approaches and Needs	13
3.3 Barriers to Teaching with Technology	16
3.4 Professional Development	21
3.5 Teacher-Family Communication	21
4. Conclusion	26
5. Appendix	28

# About the Project



COLLEGE OF  
INFORMATION  
STUDIES



THE UNIVERSITY OF  
CHICAGO

Security and Privacy Education 4 Kids (SPE4K) is an ongoing collaboration between researchers at the University of Maryland's iSchool (Drs. Jessica Vitak and Tammy Clegg) and the University of Chicago's Computer Science Department (Dr. Marshini Chetty). With funding from the National Science Foundation, the SPE4K project aims to develop and study digital security and privacy education resources by engaging with three key stakeholders in elementary education: teachers, students, and parents. The research team is collaborating (1) with elementary school teachers to design and test curricular materials, (2) with students to understand their everyday privacy and security concerns and priorities, and (3) with parents to understand how to build and reinforce home-school connections to support student learning.

Visit <https://SPE4K.umd.edu> for more information about the project and to download articles written as part of this research.

# About the Research Team

SPE4K is currently funded through a National Science Foundation grant (Award # 1951688). The project team includes three faculty from the University of Maryland and the University of Chicago, as well as a number of undergraduate and graduate student researchers. Those who directly contributed to this report are listed below.



Jessica Vitak is an Associate Professor in the College of Information Studies at the University of Maryland and director of the Human Computer Interaction Lab. Her research explores how privacy concerns play a role in technology adoption and use, and she develops tools and resources to help children and adults make more informed decisions when using technology.



Tamara Clegg is an Associate Professor in the College of Information Studies at the University of Maryland. Her research seeks to understand how we can help people come to see themselves in new ways by helping them form new relationships with information.



Marshini Chetty is an Assistant Professor in the Computer Science department at the University of Chicago. Her research evaluates how people manage different aspects of Internet use from Internet constraints such as data caps to Internet security and creating tools to help inform and empower Internet users, particularly in resource constrained settings.



Elana Blinder is a doctoral student in the College of Information Studies at the University of Maryland. Her research interests focus on understanding the ways in which technology and collaborative design practices can empower children to identify, understand, and design solutions to problems and opportunities impacting their communities.



Kevin Song is an undergraduate Computer Science major at the University of Chicago and a member of the Amyoli Internet Research (AIR) Lab.

Questions about this report can be directed to Jessica Vitak ([jvitak@umd.edu](mailto:jvitak@umd.edu)).

# Executive Summary

Between February and April 2021, SPE4K researchers conducted seven focus groups with 14 elementary school teachers from two public schools — a PreK-5 public school in Prince George’s County, MD, and a K-8 public school in Chicago, IL — to learn more about their experiences with technology and teaching. Given that one of the SPE4K project’s main goals is to develop curriculum (in the form of short “micro-lessons” that can be inserted into existing curriculum), we wanted to talk about both the challenges teachers faced using technology as well as opportunities for embedding micro-lessons on privacy and security topics. The sessions also included discussions of training (i.e., professional development) teachers had received on technology topics and, given the timing of the sessions (spring 2021), the impact of COVID-19 — and subsequent shift to remote learning — on their teaching.

## Key Findings

Below we highlight five key findings from our analysis of these sessions:

- ***Privacy and Security Concerns.*** Teachers worried about their students’ ability to safely and responsibly access, evaluate, and share information online. Anecdotes highlighted student challenges related to distinguishing between private versus shareable information and trustworthy versus misleading online content, and in navigating online communication tools. Teachers also expressed concerns about how to best protect their students during synchronous video instruction (e.g., from Zoom-bombing).
- ***Existing Teaching Approaches.*** Only a few teachers devoted substantial instructional time to teaching students about digital security and privacy. Most addressed arising and anticipated issues by incorporating privacy and security content into their core lessons as needed. This approach was hindered by time constraints and the absence of district-provided curricular resources and professional development. Teachers who did teach digital security and privacy lessons focused primarily on topics related to digital citizenship.
- ***Remote Learning Technology Challenges.*** Teachers were often forced to rely upon technology and tools that failed to address their instructional needs and the developmental needs of their students. As a result, onboarding students onto new tools could be time consuming and unpredictable. Remote learning also interfered with established assessment practices. This was due to the impossibility of synchronous progress monitoring, increased parent involvement in independent assignments, and the cancellation of standardized benchmark exams. Teachers also experienced unauthorized intruders in their video class sessions.
- ***Curricular and Professional Development Needs.*** Teachers expressed a desire for curricular materials and professional development to help address their students’ digital security and privacy needs. They wanted easy-to-implement mini-lessons and ongoing professional development that included hands-on opportunities to practice and apply

new concepts. Professional development on privacy and security topics should be ongoing rather than a one-off module.

- ***Home-School Connections.*** Teachers rarely communicated with parents about issues related to digital security and privacy outside of discussing specific incidents. They worried that parents lacked awareness about their children’s non-academic online activities but were reluctant to intervene. The significant variations in parents’ and caretakers’ computer skills also proved challenging during remote learning.

## Takeaways and Next Steps

The results of this study underscore several areas where the SPE4K project can contribute. Based on these findings, we offer three recommendations regarding next steps for each of our three key stakeholder groups (teachers, students, and parents):

1. ***Elementary teachers require additional support to effectively address concerns about their students’ online experiences and behavior.*** All 14 participating teachers, regardless of grade or disciplinary focus, expressed a desire for practical curricula and useful professional development. Though a few teachers were more confident in teaching digital security and privacy topics within their own classrooms, the need for a more comprehensive approach was broadly acknowledged.
2. ***Elementary students need authentic, developmentally appropriate learning experiences to help them safely navigate and participate online.*** Teachers shared numerous anecdotes about student missteps that could not have been prevented by a punitive list of online “dos” and “don’ts.” These findings suggest the importance of providing students with scaffolded authentic learning opportunities through which they can grapple with the complexities and ambiguities characteristic of their everyday digital interactions.
3. ***Parents of elementary school students need to be brought into the conversation in order to better understand and support children’s in-school and out-of-school technology use.*** Teachers stressed the importance of parent awareness and involvement in promoting students’ ability to make responsible well-informed choices online. The realities of distance learning during the COVID-19 pandemic highlighted the many ways in which students’ digital lives at home and at school overlapped, suggesting the need for a more comprehensive and collaborative approach toward digital security and privacy education.

Throughout 2022 and 2023, the SPE4K team will be working with teachers, students, and parents to design and refine materials focused on increasing knowledge and skills related to digital privacy and security.



# Challenges and Opportunities Using Technology in the Classroom

## 1 Introduction

Today, even our youngest children are using smartphones and tablets and engaging in learning activities online. As children find themselves using the Internet more and more, it has become increasingly important to teach them about how technology works, how to protect themselves online, and how to be good digital citizens. This was made especially clear in 2020, when schools had to quickly shift to remote learning at the start of the COVID-19 pandemic.

In response, researchers at the University of Maryland's iSchool (Jessica Vitak and Tammy Clegg) and the University of Chicago's Computer Science Department (Marshini Chetty), established the Security & Privacy Education 4 Kids (SPE4K) project, with support from Google and the National Science Foundation. Since 2016, the team has been talking with elementary school teachers, students, and parents to identify opportunities to help younger children and their families learn about privacy and security in a manner that will prepare them for the myriad risks inherent in their online experiences.

As part of this work, the team has developed the Connecting Contexts framework. The team was motivated by a gap in current approaches to teaching about privacy and security. These approaches either (1) focus on children's privacy and security learning in a single setting—typically home *or* school—or (2) do not consider the context of learning at all. Yet, children's life ecologies play important roles in promoting (or hindering) learning, as children learn between and across the settings of their lives. Without a better understanding of the contexts where children interact with digital technologies, educators will miss opportunities to leverage life-relevant experiences for privacy and security skill building for young learners. Furthermore, without a clearer understanding of how to design online privacy and security learning opportunities in different settings, parents and teachers are likely to continue crossing signals when it comes to promoting their child's privacy and security learning—expecting such skills to be developed elsewhere.

In light of this, the Connecting Contexts framework serves to build and reinforce learning opportunities across the school and home context through the use of authentic examples likely to resonate with children's everyday lived experience. The framework establishes methods for developing tools and resources targeted toward different stakeholders important in a child's learning, including parents, teachers, and children themselves. Applying this framework will generate curriculum for students, training for parents, and professional development for teachers. Curriculum and related educational materials will be tailored across three grade bands (K-1, 2-3, 4-5) so students will develop and expand their understanding of the following four core concepts throughout elementary school: how the Internet works (Internet), digital privacy (Privacy), cybersecurity (Security), and being a good digital citizen (Digital Citizenship).

By leveraging children’s learning ecologies to promote privacy and security skill development at a younger age, we will help children develop a foundation of knowledge they can build upon as they have more online experiences. This deeper understanding is imperative for better equipping children to face—and even avoid—the numerous threats inherent in their online experiences. Additionally, the Connecting Contexts framework will better prepare family members, teachers, administrators, and policymakers to work with and advocate for young children to help them develop these skills and navigate using them online.

This report shares findings from a series of focus groups conducted in the early months of 2021 with educators from our two partner schools. Moving forward, we will be working closely with the teachers at these schools to design, implement, and evaluate micro-lessons covering our core topic areas. We will also worker with teachers, parents, and school administrators to develop useful resources for and professional development sessions on topics related to digital privacy and security.

## 2 Data Collection

### 2.1 Procedure

In early 2021, the research team received approval for this project from the University of Maryland Institutional Review Board (IRB). The research team then conducted seven virtual focus groups between February and April 2021 with teachers from two public schools: a PreK-5 public school in Prince George’s County, MD, and a K-8 public school in Chicago, IL. These schools had previously been selected as partners during the grant application process. Additional information on these schools is provided in Table 1.

School Name and Location	Grades Served	Student Population	Number of Participating Teachers
Prince George’s County Elementary School, MD	PreK - 5	<b>Total Students:</b> ~600 <b>Free/Reduced Lunch Eligible:</b> 60% <b>Race/Ethnicity:</b> Black: 60%; LatinX: 29%; Other: 10%	9
Chicago Elementary School, IL	K - 8	<b>Total Students:</b> ~450 <b>Free/Reduced Lunch Eligible:</b> 64% <b>Race/Ethnicity of Students:</b> Black (91%); Other: (9%)	5

**Table 1: Demographic information on participating schools.**



The goal of the focus groups was to gain insight into the following research questions:

1. What factors impact how privacy and security concepts are integrated across home and school contexts for K-5th graders?
2. How can micro-lessons, digital tools, and resources be designed to help K-5 children connect privacy and security concepts across home and school contexts?
3. How are children's, teachers', and parents' understanding of privacy and security concepts influenced by privacy and security resources integrated across home and school?

A total of 14 teachers participated. Each focus group was conducted over Zoom and lasted approximately 60 minutes. During this time, the research team guided a discussion between teachers on the following topics:

1. Teacher definitions and concerns related to digital security and privacy.
2. Instructional approaches and curricular needs related to technology and digital security and privacy education.
3. Challenges associated with integrating technology into instruction.
4. Professional development experiences and needs related to digital security and privacy education.
5. Approaches toward communicating with parents and guardians about students' technology use and needs.

Focus group sessions were recorded and transcribed. Transcripts were imported into the qualitative software analysis tool MaxQDA and coded by two members of the research team. Once coded, excerpts were then analyzed and themes identified as they related to the research questions. We summarize these findings below.

## **2.2 Participants**

We spoke with 14 teachers from the two schools. Some participating teachers worked within a single grade level while others taught students across multiple grades. Some were multi-subject classroom teachers, while others taught one or two subjects within a single grade level, and five of the participating teachers taught a single subject across multiple grade levels. Subjects taught included general education, math, science, library, music, and Spanish.

## **3 Key Findings**

The findings are organized into five major themes identified while analyzing the data: (1) teachers' definitions of and concerns about digital privacy and security, (2) current teaching approaches and needs; (3) barriers to teaching with technology; (4) professional development;

and (5) teacher-family communication. Below, we expand on each theme and provide teachers quotes to support each claim.

### 3.1 Teacher Definitions and Concerns

When asked to define digital privacy and security in their own words, teachers emphasized aspects of information sharing, digital literacy, and digital citizenship. Several teachers also touched on concerns related to their professional and ethical responsibility to protect their students' privacy, particularly when teaching virtually. Many teachers grounded their definitions in concerns arising from specific incidents they encountered while teaching both remotely and in-person.

**3.1.1 Information sharing.** Many teachers stressed the importance of recognizing the difference between information that is public versus information that is private. They spoke about maintaining the security of private information like passwords and personally identifiable information (PII), as well as about issues related to persistent public information in the form of a “digital footprint.”

*Keeping their digital footprint safe and making sure that they know how to keep their passwords and their sites safe. And then also knowing what they post online matters, it just doesn't disappear. —Kindergarten Teacher*

*One thing that I felt was important for them to learn since technology is being used at younger and younger ages is how you're curating, almost in some way, an identity on the Internet, like on social media. —Fourth Grade Math and Science Teacher*

**3.1.2 Evaluating the credibility of online information.** Another component of teachers' definitions was the ability to judge whether digital content is trustworthy. These are important components of digital literacy and media literacy, and both have become more important over the last decade as fake news and misinformation have become more prevalent on social media platforms. Some teachers acknowledged that this aspect of digital security and privacy is challenging — and not only for their students, but also for themselves. As a result, some suggested that an important aspect of digital security and privacy is knowing when to seek help and what to do when you've made a mistake.

*Always checking with an adult. We're there to support them if they don't feel safe. Or if they're on their own and they see something that's strange or they don't feel comfortable, they should just log out. —K-8 Spanish Teacher*

*I think even for adults, the sophistication of scams and phishing... the landscape has become more difficult. How do you help kids recognize potential harm, when it's hard for you as an adult to see it as well? —School Librarian*

Other questions of legitimacy were related to determining when it is safe to click on a hyperlink, and evaluating the veracity of content found on websites, including embedded ads, which might be confusing to children, especially when offered a free game or toy.

**3.1.3 Digital citizenship.** Several teachers spoke of digital security and privacy in terms of respectful and responsible participation in online communities and activities. They wanted students to understand how their interactions online could have a broader impact on their own and others' emotional safety and well-being. One teacher expressed concerns about their students interacting with strangers on an online gaming platform, while others emphasized how anonymity could taint interactions and lead to various forms of cyberbullying. Finally, some teachers stressed the importance of learning how to effectively regulate behavior when confronted with manipulative digital design features such as continuous scrolling and game incentive systems.

*Most of our fights last year and the year before started on social media. Something was shared, a picture was taken and it spread. I don't think they understand that, once you post something, it's pretty much there forever and anybody has access to it. I do find that's a huge problem with upper grade students. It's going even down to third and second grade now because a lot of them have social media accounts. I have kindergarteners on Snapchat. —Kindergarten Teacher*

*Another thing that feels really important to teach kids in the digital age is what the effects of anonymity can do to people, and how people will act very differently when they know that they're posting anonymously rather than posting with their name attached to something. — Fourth Grade Math and Science Teacher*

**3.1.4 Teacher responsibilities.** Some teachers spoke of digital security and privacy in terms of their professional commitment to keeping students safe online but expressed ambivalence regarding their ability to monitor student online activity during school hours. Teachers took it upon themselves to understand and implement privacy settings on digital platforms to limit the visibility of their students' posts beyond their classroom or school community.

*I'm doing a Flipgrid right now for the kids. Their responses are visible, but only to those that are in the district that have the link to the page. That's privacy within the small community. You have to be very careful about how you set up privacy on Google classroom as well because content can very easily become public. It's scary. I don't want a kid to end up doing something in public. —PreK-5 Music Teacher*

Many teachers used or had access to apps like GoGuardian and Hāpara, which enabled them to observe students' online activities while using district-issued accounts and devices. Several teachers expressed discomfort in exercising this level of surveillance over their students. On the one hand, they wanted to ensure students were engaging with instructional content and not being exposed to anything inappropriate during class. On the other hand, some speculated that these apps may compromise students' privacy rather than protecting it.

---

*“You have to be very careful about how you set up privacy on Google classroom as well because content can very easily become public.”*

---

*I use it sometimes. I felt a little weird about it because... In the classroom I have no problem using GoGuardian, but when a student is in their own home and I'm seeing what they're doing on the computer at their house, something about that feels maybe a hair past a line that I would be comfortable with. —Fourth Grade Math and Science Teacher*

*I'd look and they'd be on YouTube looking up who knows what and making crazy comments, and they're five. —Kindergarten Teacher*

Another aspect of digital security and privacy pertained to the use of cameras and audio during synchronous online sessions. Some teachers were opposed to policies requiring the visibility of students at all times during class, noting the potential privacy issues, stress, and fatigue associated with such an approach. At the same time, teachers recognized the challenge of assessing students' engagement and understanding without some mode of synchronous interactions. Some teachers also recounted incidents where family members could be seen or heard in the background of a Zoom call and acknowledged this could compromise the privacy of individual students and their families in addition to potentially exposing the entire class to inappropriate language and interactions.

*If I ask you to unmute and talk, you've got to do it. That's one area of privacy that I don't compromise on because, if we're in class, you've got to talk. You can have your camera off, but we must have a dialogue in some way. The camera is a big issue for me. It seems like at the elementary level, it's enforced with draconian measures. I've read that some districts have Zoom abilities for teachers to force turn on students' cameras. I find that appalling. —Fourth Grade Math and Science Teacher*

*A lot of the time, we're coming into their homes, and sometime the parent and the kid may live in a very small living quarter. What if a girl has to walk by to change clothes? There are things that we take for granted, but sometimes I'll be like, "Oh my gosh, no, you need to turn off the camera." —Second Grade Teacher*

## 3.2 Current Teaching Approaches and Needs

The introduction of online learning due to the COVID-19 pandemic prompted many teachers to cover topics related to digital security/privacy and technology in more depth than they had previously. Most teachers integrated relevant aspects of digital security and privacy instruction into lessons devoted to their core curriculum, apart from library and media specialists, who were more likely to directly address these topics through formal lessons and activities.

**3.2.1 Instructional priorities, resources, and strategies.** None of the teachers received digital security and privacy-specific curricula from their district, though a few independently sought out or developed their own resources. Common Sense Media<sup>1</sup> and Teaching Tolerance<sup>2</sup> were two supplemental curricula mentioned by teachers. Two teachers reported using the Common Sense curriculum to cover basics like developing strong passwords and exercising caution when

---

<sup>1</sup> Common Sense Media has a section for educators, including curriculum. See <https://www.commonsense.org/education/>

<sup>2</sup> Note: Teaching Tolerance is now called Learning for Justice. See <https://www.learningforjustice.org/classroom-resources/lessons/privacy-and-security-online>

following hyperlinks. Teachers appreciated that Common Sense materials were easy to integrate into their regular instruction, though one mentioned that the depth of the lessons, at times, felt insufficient. One teacher used the Teaching Tolerance curriculum, which they felt was especially useful in approaching digital security and privacy education through a social justice lens.

*Using Common Sense has really been my saving grace when it comes to teaching about privacy and security and about digital citizenship overall. I do find sometimes that their lessons — I don't want to say they're unrealistic — but I think they don't get into the real meat of privacy and security beyond the surface. —School Library and Media Specialist*

One teacher used resources from Nearpod<sup>3</sup> to introduce digital citizenship concepts early in the year and revisited them with students periodically throughout the year. Other teachers said they addressed digital security and privacy content informally as needed, such as explaining that “*your password is your password, and it's not something that you should share with people*” while onboarding students onto a new digital tool.

Though not specific to digital security and privacy, some teachers incorporated instruction related to technology when they felt a particular tool would serve a broader learning goal in their curriculum. During in-person instruction, this typically took the form of a whole class mini-lesson, with teachers attending to individual student needs and troubleshooting as required. The shift to remote school prompted many teachers to develop additional asynchronous content that students and their families could refer to as needed, such as “*videos about how to upload a document and other basic things kids need to know to be successful in digital learning.*”

*We have many lessons with technology but they're like stop-gaps. It's when something comes up that we need to get something done, then we have a mini lesson. They're pre-planned but not by more than a couple of days, for me anyway. As my colleague and I are looking through the curriculum and figuring out what we're doing for the next week, we'll say, “Oops, they need to know this so let's plug this in.” —Fourth Grade Math and Science Teacher*

Across all grade bands, teachers described their approach toward teaching about digital security and privacy as embedded in the broader project of building a safe and caring classroom community. For teachers in younger grades, these lessons often focused on helping students identify and understand the emotions that can arise while engaging with content online. Teachers in older elementary grades were more inclined to prompt students to consider the implications of their perceived online anonymity and the similarities and differences between online and in-person communication. Some teachers incorporated digital citizenship content during their regular lessons, emphasizing ethics of Internet use, mutual respect and kindness, technology and emotions, and digital footprints.

---

<sup>3</sup> <https://nearpod.com/>

*At the beginning of the year, especially with the younger kids, I tried to touch on the strategies for what to do when they're encountering those websites that maybe they got to on accident. One example that we used earlier in the year was, if they were searching for hearts, maybe they Google "love," and then they came to pictures of people kissing or something like that. For elementary school students that will be "eww." —School Library and Media Specialist*

*We talked about what it looks like to have a kind, respectful online community and what we would expect out of other members of that community. We also discussed what it might look like elsewhere on the Internet. What is unsafe? What kind of community would you not want to participate in? So we touched on cyberbullying a bit. And we touched on anonymity on the Internet. —Fourth Grade Math and Science Teacher*

**3.2.2 Curricular needs.** Format was as important as content in determining the types of curricular resources that would be most helpful in addressing teachers' digital security and privacy concerns. Teachers expressed a need for content that could be easily shared with families and flexibly integrated into their regular instruction. Some emphasized the importance of developing an aligned definition across teachers, students, parents, and administrators since perspectives and levels of awareness could vary within and across these groups. Many felt a digital format would facilitate distribution and engagement throughout their broader classroom and school communities.

*I think we need a basic curriculum because digital privacy probably means different things to everybody, including parents. Parents need to have access to some kind of curriculum or program because they may not know what it is and how to help their child. —Fourth Grade Math and Science Teacher*

*Sometimes you don't feel a need for [a lesson] at point A, but three months later you might have that need, and no longer remember the details. So having some kind of a resource that's housed in a findable place, and that is hyperlinked to those mini lessons would be helpful, I think. —School Librarian*

In addition, teachers emphasized the importance of having some degree of autonomy in selecting the activities and instructional sequence and format that would best support the needs of their students.

*Maybe some very short mini lessons. Not even like, here are all the things that you have to do, but here are some suggestions if you run into these kinds of issues. Here's a quick little mini lesson that you can do with your class to help mitigate that issue. —Kindergarten Teacher*



Teachers in older grades highlighted the importance of building students' conceptual understanding and applicable skills related to information sharing, evaluating the credibility of online content, and digital citizenship. In addition to the many examples discussed above, upper-grade teachers also emphasized the challenge of helping students effectively and ethically conduct online research. They felt a digital security and privacy curriculum should support students in learning how to search for reliable content and use it to support their own ideas without plagiarizing. Additionally, they expressed a desire for materials that would help support their students in safely navigating concerns related to social media use.

---

*“Parents need to have access to some kind of curriculum or program because they may not know what it is and how to help their child.”*

---

*As they're doing research, the boundaries have opened wide and they have access to lots of different sources of information. They should be learning how to do searches in an efficient way, learning how to discriminate between ads and useful content, and learning how to evaluate content. I think this is one of the key challenges. —School Librarian*

*I think that in the world that we live in, at a certain age kids do need to experiment with social media platforms so that they know how to use them appropriately. But we need to figure out a gradual release, a safe space, to slowly get them used to things. And also, knowing what apps would be appropriate for kids and which ones might be better for teenagers or college students. —Fourth Grade Math and Science Teacher*

While teachers in upper grade bands focused on issues related to some of the more ambiguous aspects of internet use, teachers working with students in early elementary school grades expressed a desire for instructional materials that acknowledged developmental needs specific to younger students. They spoke of a need for clear guidelines that would be comprehensible to students less adept in abstract reasoning. These teachers also requested materials that would be suitable for pre- and emergent readers struggling to make sense of text-centered navigation in digital environments.

*At this age, since the children aren't even reading yet, when they end up somewhere it's usually because there's a bright picture, or an icon that looks fun, or they think it's a game. They end up in the wrong place because they don't know what they're doing. —PreK Teacher*

*With the younger kids, I just think they're impulsive because this is their first time really having the Internet and a computer for a long period of time, right? One of my students decided to go and purchase something, and things like that they don't know, like a website... I would hope that nothing would pop up, right? But, for me, I know even with [my school] emails sometimes I'll get a link saying, "FedEx, you have a package." I'm thinking, "I'm not buying anything." I look carefully, and the word FedEx is not spelled correctly. But how would kids know? —Second Grade Teacher*

### 3.3 Barriers to Teaching with Technology

Many teachers said they felt overwhelmed and somewhat uncertain about their ability to effectively prevent and address digital security and privacy-related issues within their instruction. This was most often due to a lack of institutional support at the district level, shortcomings in the online tools and systems with which they taught, and blurred boundaries between home and school.

**3.3.1 Constraints on time and resources.** The majority of teachers lacked time to devote to developing and implementing digital security and privacy related lessons, both prior to and during distance learning. Without a formal curriculum, relevant professional development, or substantial school-based support, teachers found it difficult to carve out the time to effectively brainstorm, research, and design lesson plans related to technology and digital security. Even if these resources were available, teachers acknowledged that nearly all their instructional time was accounted for and that substantial diversions from the core curriculum could be challenging to squeeze into an already jam-packed schedule.

*Even though it's incredibly important, we've discussed that the county doesn't give any time whatsoever for digital literacy in any way, shape, or form. No special pull-outs. We used to have a tech specialist. They always just gave typing lessons. —Fourth Grade Math and Science Teacher*

*We never formalized anything to say, "Well, maybe today let's have a quick mini-lesson about how to be safe on the Internet." There's never time for that. —Second Grade Teacher*

In the absence of a clear district-wide policy, teachers were left to their own devices to determine what was and was not safe and appropriate for their students. Teachers did not always feel confident in their ability to make such decisions. Though districts provided basic information to help teachers, students, and families access online content during the pandemic, teachers generally felt they needed more support and guidance. They wanted more comprehensive and consistent guidelines to incorporate lessons on digital literacy and citizenship, and professional development that went beyond learning how to simply use a specific technology.

*With the support being decentralized, teaching Internet safety is everybody's business now. What is the framework we should be looking at? —School Librarian*

*I think a lot of us are very nervous with this whole idea because we want to make sure to protect our students, but we haven't had any formal lessons or we haven't even taught them lessons — even mini-lessons to embed in a social studies curriculum — to help them navigate the Internet and be safe. —Second Grade Teacher*

**3.3.2 Technology challenges for teachers.** Teachers notes it was difficult to anticipate how student-facing digital tools would be seen and used. Many teachers struggled with their inability to access the “student view” in apps and platforms, which made it all-the-more

challenging to onboard students onto new tools and to help them troubleshoot when issues arose. Moreover, teachers often had no way of knowing if a particular website would be blocked on their students' school-issued devices. This often required them to develop on-the-fly workarounds in the midst of a lesson.

*[When teaching in person] you could lean over someone and say, "Here, there it is." Whereas now, we're like, "Who wants to share their screen and show us this?" Because every single app we use looks different for the teacher than it does the student. —Fourth Grade Math and Science Teacher*

*Something that's quite frustrating is we don't know what sites are blocked for kids because they're not blocked for us to the point where there's been an activity that I planned on giving to the kids. All of a sudden, 30 kids are like, "We can't see it. It's restricted." —PreK-5 Music Teacher*

Some teachers were also surprised by the lack of inhibitions students displayed online, clicking and sharing content and information in a manner that could disrupt the flow of instruction.

*I'd be presenting early on and they would be scribbling over my presentations. They're not afraid to do anything with this stuff, whereas I'm like, "Oh, what happens if I click this button?" —Fourth Grade Math and Science Teacher*

*The kids are getting savvy, so I have to block [Google] Meets because the kids go and set up their own Meets and they do their own little chats. —Fourth Grade Math and Science Teacher*

Teachers faced obstacles in assessing certain competencies among their students remotely. Many of the informal assessment practices employed in the classroom proved difficult online, given teachers' inability to walk around the room or work with small groups while keeping an eye on the rest of the class. Furthermore, some teachers worried about the degree to which students were receiving support (from parents, the Internet, etc.) while completing synchronous and asynchronous assignments. This further compromised their ability to reliably assess their students' progress. Finally, with many formal benchmark and standardized assessments cancelled during the pandemic, some teachers worried about their inability to effectively anticipate and prepare to meet the needs of their future students during the upcoming academic year.

*It's hard not knowing how much assistance they're getting at home before they turn something in and trying to get a feel for what they need. I do a lot of journal writing in my classroom. I want the kids to use technology, but at the same time, you can't learn how to create the letter A without picking up a pencil and having paper in front of you. It just doesn't work. —First Grade Teacher*

*One of the issues when we return is getting that baseline data because we don't have enough data on these students. We're a year behind with data because some of the tests were thrown out, thank goodness. —K-3 Math Instructional Lead*

At the beginning of the shift to remote instruction, teachers had no choice but to rapidly develop new technology and digital security/privacy skills. Though they varied in their overall computer literacy, teachers demonstrated an ability to troubleshoot, develop work-arounds, and anticipate tech-related issues as a result of their experiences teaching online. Considering the enormous challenges they faced in the early days of the pandemic, a proactive approach toward preventing digital security and privacy issues was, in many regards, beyond their grasp. However, teachers quickly developed strategies for addressing issues as they arose, and used the insights they gained to develop a more systematic approach toward teaching with technology.

---

*“How do we find a balance between using technology and not overly using it?”*

---

*At the beginning of the year, they didn't really give us any heads up of what was going to happen. We were flying by the seat of our pants. And your whole lesson that you planned out, that you want to be perfect for the first day of school, just falls flat. There was something with the Chromebooks and the chat where they couldn't click on the link. It was an absolute disaster. I emailed someone at the technology department who said, "Oh, there's nothing we can do to help with this." That's why I just started posting everything on Google classroom because the students are familiar with this. —Second Grade Teacher*

*With Zoom, a lot of teachers have the chat open but where it only goes directly to them. Two reasons for that. One, because you don't know what someone might say. Then the second thing is, a lot of times in the chat, you're asking them to share an answer, but you want everybody else to have some think-time to themselves. If it goes straight to you, then everybody else doesn't feel pressured or rushed or whatever. —K-3 Math Instructional Lead*

Though teachers were eager to return to their classrooms, many acknowledged that the skills they were developing as remote teachers would remain relevant to their future classroom-based work. Some described how they'd adapted their use of digital tools to reflect their pre-existing in-person teaching priorities, and their intention to continue using some of the tools and strategies they'd learned to use during the 2020-2021 school year. Others expressed concerns that some teachers might return to tech-free pre-pandemic pedagogical approaches without recognizing and leveraging the advantages of tech-enhanced instruction.

*A lot of teachers are saying all the homework now is going to be online. ...Even when we go to a more traditional schooling setting, students are still going to need to know how to navigate this computer safely. —Kindergarten Teacher*

*When everyone is back in the building... how do we find a balance between using technology and not overly using it? I feel like those teachers who were resistant are still putting their best foot forward now because we're distance learning, but what will they do when we go back to the building? Are they going to remember how engaged some of these kids were that probably would not have been engaged without technology? —K-3 Math Instructional Lead*

**3.3.3 Tech challenges for students.** The amount of time and support required to get students up and running often outweighed the potential benefits of engaging with a particular tool or program. Though teachers saw improvements in their students' computer skills during distance learning, technology-associated challenges continued to consume a significant portion of their instructional time. Moreover, student competencies varied widely, with some students soaring ahead and growing impatient to receive the next set of directions, while others were constantly struggling to keep up.

*I started using Pear Deck<sup>4</sup> early last school year. There was one class that mastered it, whereas the other classes, every time, it was like, "Where do I put the code? What's the code? What's the website?" I'm like, "We have five minutes left, so just forget it." As much as I try to do various things to integrate technology, it turned out to be a serious chore. —School Library and Media Specialist*

The lack of developmentally appropriate online interfaces compounded these challenges. As one teacher in the grade 4/5 band noted, *"Zoom is not a platform for education. We use it as best as we can, but it's not built for us."* While teachers were obviously compelled to do their best to support students, online learning proved especially challenging for younger children still developing their fine motor skills and learning to read and write and follow multi-step directions.

*In addition to not reading, there's a challenge with sequential skills and with keyboard knowledge. In the very beginning, kids often spent more time logging in than actually using the application. —School Librarian*

**3.3.4 Privacy and security concerns.** Teachers experienced recurring issues related to maintaining the security of student passwords and accounts. Students' accounts would often be accessed, both intentionally and unintentionally, by someone other than the account holder. In a school-based setting, this most often occurred when a student forgot to sign out of their account on a shared device. During remote school, similar issues arose when siblings in the same class or grade would accidentally complete or submit an assignment while unknowingly logged into their sibling's account. Some students also intentionally shared their account credentials with friends.

*Just trying to teach the children about making sure they secure their account and secure their information, making sure they understand that this computer is being used by more than one person and you have to log out of your account every time. —School Library and Media Specialist*

*I guess they didn't understand what passwords were. So they were signing in with each other's passwords and changing settings. It wasn't a big thing, but it was an issue because they were logged into somebody else's Google Classroom account. —Kindergarten Teacher*

---

<sup>4</sup> <https://www.peardeck.com/googleslides>

There was also concern that students could be exposed to inappropriate content while engaged in school-related activities. Many teachers recounted incidents where unauthorized users gained access to their synchronous online sessions in Zoom and Google Meet. One teacher speculated that this may have been the result of students sharing links and passwords amongst their friends. Such incidents upset students, disrupted classroom lessons, and prompted teachers to develop contingency plans with their students to better ensure their safety.

*When we started using Google Class, we had a lot of break-ins. We don't even know how. Sometimes, the class would start, and then somebody would come into the room, a stranger, and they were foul. The kids were scared. So I told the kids, "We need to be prepared for these types of things." If it happens, we turn it off, we log out, we wait five minutes, and then we log back on. —K-8 Spanish Teacher*

Some teachers also expressed concern that students might mistakenly encounter such content while conducting online research.

*Only so much is blocked and so much is accessible from home. I send them home with a project. I don't know what kind of blocking they're going to get there. I don't know what kind of forums they're going to participate in. As much as I would love to, I don't know what kind of ads and stuff they're going to see. I searched "time" the other day on YouTube and got Victoria's Secret. —PreK-5 Music Teacher*

As previously noted, teachers worried that their students lacked the critical skills needed to distinguish between authentic and misleading online content. Several teachers recounted incidents in which students mistakenly clicked on ads while conducting online research and entered personal information. Teachers also noted that these issues were prevalent in students' non-instructional online activities, such as when they interacted with strangers in online gaming environments or social media. While such activities were previously relegated to out-of-school time and therefore not under teachers' direct jurisdiction, the realities of remote learning during the pandemic blurred these boundaries, with several teachers noting occurrences of students engaging in these types of activities *during* class. While teachers felt it was important for students to develop the ability to evaluate the credibility of online content themselves, many used monitoring apps to place blocks on students' devices when they were discovered to be playing games, watching YouTube, or surfing the web during class.

*A student was looking for something for math and she didn't know how to spell "math," and other things were popping up. It wasn't completely inappropriate, but she didn't know what to do. And she started clicking on things and then ads popped up. —Kindergarten Teacher*

*I feel we need some type of firewall where these kids cannot go to anything except these six things unless we put it in a link where you can directly click on it and we can basically monitor these things. —K-3 Math Instructional Lead*



**3.3.5 Parent interventions.** The blurring of boundaries between children’s home and school life during remote learning raised unique instructional challenges. Teachers discussed numerous instances of parents interacting with their children and, by extension, the entire class, during synchronous video sessions. These interactions took various forms. A student might summon a parent to help with a tech-related issue or a parent might be overheard encouraging or admonishing their child during class. One teacher also shared an incident in which they felt inappropriately antagonized by a student’s older sibling.

Though teachers appreciated the potential benefits of having parents more involved in their children’s learning, this increase in parent involvement also could, at times, pose a challenge to teachers’ ability to maintain the flow of a lesson and to maintain a positive and supportive learning environment. As mentioned previously, increased parent involvement in asynchronous learning activities could also impact a teacher’s ability to accurately gauge students’ true level of progress and understanding.

*I was asking a [student] a question, and I wanted him to figure it out.... His father just starts yelling at him. "If you're listening, you would have known the answer." I was mortified, and I just felt so bad for the kid. Then, I've had a parent feed her kid the completely wrong answer. I was like, "Oh God, at least get it right." — PreK-5 Music Teacher*

### 3.4 Professional Development

Across the board, teachers wanted practical and meaningful professional development on best practices for teaching students about digital security and privacy. While many a return to in-person school was imminent, they also anticipated that teachers would continue to rely upon many of the digital tools and platforms they adopted during remote school.

**3.4.1 Existing professional development opportunities.** Most teachers received at least some professional development about protecting students’ data and safety online, but felt that existing approaches left much to be desired. Professional development on these topics primarily took the form of one-off training workshops and optional video modules offered by a district. Video modules addressed “malware,” “password security basics,” “cyberbullying,” “email and messaging safety,” “predators,” threats of violence,” and “online safety.” Some teachers found these videos useful. Others felt that the format and optional nature of these trainings did little to promote deep sustainable professional learning.

---

*“We already have enough trouble keeping up with our required trainings. Who's going to go in and watch all those “suggested” videos?”*

---

*We already have enough trouble keeping up with our required trainings. Who's going to go in and watch all those “suggested” videos? —Kindergarten Teacher*

*Who listens to them, to be honest? You put it on in the background, take the quiz... No, I don't get much out of them. —Fourth Grade Math and Science Teacher*

Several teachers expressed disappointment with professional development more broadly, citing facilitators who lacked expertise, unengaging presentation formats, and minimal opportunities to practice and apply new skills as ongoing issues.

*It needs to be done in a way that doesn't make us want to tune out. Quite frankly, I find professional development to be the most boring thing I've ever done in my life. I'd rather go to the dentist. — Fourth Grade Math and Science Teacher*

In contrast, teachers across all grade bands received minimal-to-no professional development related to best practices for *teaching their students* about digital security and privacy. Those who had received relevant professional development had primarily sought it out on their own out of personal interest and a desire to bridge these gaps. Given the dearth of free time teachers had to devote to such pursuits, this was uncommon in spite of teachers' widely acknowledged need for more training.

*Every year we have these videos we have to watch. There's one on developing good passwords and not falling for phishing scams and things like that, but that's all for the teachers. It's not really how to teach the students —Second Grade Teacher*

*I've never had any professional development that was related to kids' internet safety. The only thing that I've been able to find and I've been involved in or about... Like this year scams and what you should look out for in your emails, but nothing really how to teach somebody else to safely use the internet. —Kindergarten Teacher*

**3.4.2 Professional development needs.** Teachers expressed a desire for ongoing professional development and support with built-in opportunities to apply and practice what they'd learned. Given their distaste for dry lectures and video modules, teachers suggested a more interactive and practical approach toward professional development in which they could develop and refine materials and receive feedback on their implementation. They felt that a single workshop would prove inadequate in preparing them to effectively teach their students about digital security and privacy.

*Having something where we're able to check in or where someone can follow up and say, "I observed this. Instead of doing that, this is how you could actually implement this," or "this is how you could actually integrate technology at this point." —School Library and Media Specialist*

*We've had lots of digital training, but it's an hour here, this is what you got, go. The actual time available to be able to work with it and play with it and try to develop it, isn't there... You can't just hand it to me and say, "Here." You have to let me work with it and involve me in it. If you start lecturing at me, I'm going to tune out. —PreK Teacher*

### 3.5 Teacher-Family Communication

Teachers varied in their approaches toward keeping families informed about students' technology use. This was not surprising, given that multigrade teachers often had upwards of

100 students, whereas single-grade teachers typically had far fewer. Some teachers felt that providing parents with a more consistent window into their daily teaching practice during remote school inspired a greater appreciation for their work, while others found parents' new level of involvement to be overwhelming at times.

**3.5.1 Existing approaches.** Teachers communicated with parents in a variety of ways and to various extents, though such communication was infrequently related to digital security and privacy. Several said they took advantage of in-person workshops at the beginning of the school year to discuss technology with parents, though noting that such events were not always well attended. Some teachers were more proactive during remote learning, using tools like ClassDojo<sup>5</sup> and Hāpara<sup>6</sup> to communicate information related to technology and digital security and privacy. Most teachers rarely engaged in discussions about digital security and privacy topics with parents, but would reach out in the event of a specific security incident involving students. They would also occasionally be asked to address parent concerns related to out-of-school incidents that might impact students' overall well-being and academic experience.

*A lot of what I do is I go on ClassDojo, and I give out bulletins. If something comes out, even if I learn about it outside of school, I will put it in there saying, "Hey, this is going on, just so you're aware of it. This app has been in the news. You might want to check with your kids and talk to them if they're using it." —Fourth Grade Math and Science Teacher*

*I communicate with parents frequently, but it's not usually about online privacy or using your computer correctly. I communicate with them more for virtual school than I did for in-person school. The only time it ever relates to technology is if we have a standardized countywide assessment coming up. Then it's, "Please make sure you have this app downloaded." It's all the security measures for the tests. —Fourth Grade Math and Science Teacher*

**3.5.2 Challenges and needs.** Teachers noted that parents' computer skills and comfort with technology varied widely. Whereas some tech savvy parents were able to help teachers and other families troubleshoot tech issues, others struggled to help their children log onto Zoom. Though parents generally seemed confident using their phones to communicate and access information, many were daunted by computer-based tasks. This made it difficult for teachers to develop a unified approach toward supporting families during the transition to distance learning. In addition, many children relied upon grandparents and other family members for support during the school day, many of whom lacked substantial experience working with digital technology.

*Parents are right there with the children, so they're watching you constantly. What I discovered was that some of them were very savvy. They know everything. They were telling me, "Click here, do this." Then some of them were like, "I don't know. I don't know how to turn this on." —K-8 Spanish Teacher*

---

<sup>5</sup> <https://www.classdojo.com/>

<sup>6</sup> <https://hapara.com/>

*I said, "Is there somebody at home who can help you?"... And he says, "Well, can I call my mom?" I said, "Well, who's at home with you?" He says, "My grandma, and she doesn't know anything about this stuff." —School Librarian*

In general, teachers believed that parents lacked awareness about the types of activities and behaviors their children were engaging in online. While this was somewhat of a concern prior to the pandemic, the issue became more pressing during remote learning, when children found themselves online for long periods of time without in-person adult supervision. Many felt parents underestimated their children's abilities and proclivities for engaging in potentially dangerous online activities, or incorrectly assumed that teachers were capable of monitoring students' behavior to the same extent that they had in the classroom.

*I've had several conversations with parents about things their child was watching on YouTube, because I use GoGuardian so I can see what they're doing instead of paying attention in class. And they just didn't know their child could find those things. So I think that they don't know how capable they are or how easy it is. I have one kid that has figured out how to open up multiple tabs. So it looks like she's in class, but she's really not. She's on some YouTube sites. And when Mom walks past, she clicks over again. —Kindergarten Teacher*

*I think when the kids are in the classroom, the parents assume, "Oh, they're with the teachers. The teachers are keeping them safe." I think they really rely on us and they trust us and think whatever program we're teaching or link we send to the kids is appropriate. But I don't know how much they know in terms of the details of what their kids are doing online, and the things that the kids should not be doing or sharing. —Second Grade Teacher*

Furthermore, blurred boundaries between home technology use and school technology use, both before and during the pandemic, left teachers uncertain about whether direct involvement was warranted in certain situations. Incidents that occurred outside of school involving multiple students from a given class or grade could clearly impact in-school behavior and the overall learning climate of a classroom. At the same time, teachers felt they lacked both the authority and obligation to monitor students' online activities outside of class time. Parents, at times, disagreed. The introduction of distance learning further complicated these dilemmas, given that teachers found that even their ability to monitor student activity *during* class was now compromised.

*It was very hard for me to figure out a way to tactfully tell a parent that there's only so much I can do as a teacher when it comes to students' use of TikTok at home. I don't know quite how to handle this anymore. —Fourth Grade Math and Science Teacher*

*We have been told that once three o'clock comes, we are not responsible. We're not the Internet police. Even though we know kids are not where they should be, we're not allowed to intervene at all at that point. — Fourth Grade Math and Science Teacher*

*You don't know where that line is. They are at home and who's in charge? The teacher or the parent? As far as I'm concerned, the parent is. It's their home. Regardless of the fact that we're in class, they are still at home physically. If something goes on at home, I can't do anything about it. — Fourth Grade Math and Science Teacher*

Parent engagement with digital security and privacy topics was deemed crucial to fostering students' digital literacy and ensuring their online safety both in and out of school. Recommended approaches toward raising parent awareness and confidence included providing a series of informative online videos, providing a curriculum parents could use to guide conversations about digital security and privacy with their children, implementing student-teacher-parent conferences and contracts to ensure that all parties understand the rules and consequences, and conducting parent workshops about security settings and content filters.

*I don't know how to better engage the parents with this, because parent engagement definitely is a big part. A lot of the things that were coming to us in prior years was parents saying their kid received this type of text message or this type of email—things happening off of school grounds. —K-3 Math Instructional Lead*

*TikTok, it's recommended for ages 13 and up, and we're talking about 9-10 year olds here. Everyone glosses over terms of service. Maybe giving parents a survey of what social media they're allowing their children to use and then maybe a workshop model or short lessons for parents where you walk them through the presence or lack of presence of security features, how you can turn them on for your students. —Fourth Grade Math and Science Teacher*

*I feel like that one-on-one conversation needs to happen when there's a contract being signed. Fifth grade students who have cell phone devices, they have a contract that they have to sign. It's like, "I'll keep my phone in my backpack," so on and so forth. We need to create a document that is signed by the students and parents. This is the infraction; this is the consequence. It just needs to be out there because parents will go to bat for their kids, rightfully so, but you can't be combative when you're doing something wrong. —K-3 Math Instructional Lead*

Teachers also emphasized the need to convey the limitations on their own abilities to closely monitor all students all the time — both in an in-person and a remote learning environment — so that parents would have realistic expectations and be more inclined to share the burden in teaching their children about what responsible online behavior looks like.

*Parents need to know that your kids cannot be monitored at all times. Maybe they understand that more now that the kids are in the house, but even in the classroom, they can't be monitored. —PreK-5 Music Teacher*

*Sit down with your kid, and have a courageous conversation, and talk about what a good digital citizen looks like. I can't tell anybody what to do in their house because I don't pay their bills, but kids are going to do what they think they can get away with. If they have some guidelines at home and go over them often, it might eliminate some of these issues. — K-3 Math Instructional Lead*

## 4 Conclusion

Elementary school teachers at our partner schools have identified a number of challenges and opportunities for developing training, curriculum, and other resources to help teachers, students, and families learn more about digital security and privacy. Based on these findings, we offer the following takeaways for each stakeholder group.

1. **Elementary teachers require additional support to effectively address concerns about their students' online experiences and behavior.** All 14 participating teachers, regardless of grade band or disciplinary focus, expressed a desire for practical curricula and useful professional development. Though a few teachers were more confident in teaching digital security and privacy topics within their own classrooms, the need for a more comprehensive approach was broadly acknowledged. Professional development should be ongoing and well-integrated to their everyday work tasks, rather than one-off workshops or training modules. Curricular materials should be easy to integrate with existing lessons and should connect to students' current technology use at school and home.
2. **Elementary students need authentic developmentally appropriate learning experiences to help them safely navigate and participate online.** Teachers shared numerous anecdotes about student missteps that could not have been prevented by a punitive list of online "dos" and "don'ts." These findings suggest the importance of providing students with scaffolded authentic learning opportunities through which they can grapple with the complexities and ambiguities characteristic of their everyday digital interactions. This was especially clear when hearing teachers of younger students share their struggles getting a class signed into an app; lessons need to start with the basics, then build on those basics as students get older. Connecting lessons to students' everyday experiences (e.g., talking about keeping secrets when discussing privacy, or using a popular gaming app to talk about security) will make lessons more salient.
3. **Parents need to be brought into the conversation in order to better understand and support children's in-school and out-of-school technology use.** Teachers stressed the importance of parent awareness and involvement in promoting students' ability to make responsible well-informed choices online. The realities of distance learning during the COVID-19 pandemic highlighted the many ways in which students' digital lives at home and at school overlapped, suggesting the need for a more comprehensive and collaborative approach toward digital security and privacy education. Beyond that, teachers' observations of significant variance in parents' digital skills highlight the need for more opportunities for parents to learn about new technology broadly and digital security and privacy specifically. Such resources could be shared at Back-to-School events, or sponsored by Parent-Teacher organizations, or shared virtually through digital materials.

Moving forward, the SPE4K research team will use findings from this study to inform the content and structure of future professional development and curricular materials. In 2022, the



team will lead collaborative design sessions with Maryland and Chicago teachers to develop these materials. We plan to begin testing them with a subset of teachers in Q4 of the 2021-2022 school year.

Also in 2022, SPE4K researchers will conduct interviews and focus with school parents to better understand digital security and privacy concerns specific to the home context, and to begin designing parent-focused resources.

For the most up-to-date project information, visit <https://SPE4K.umd.edu>.

## 6 Appendix: Educator Focus Group Protocol

**Moderator:** Welcome and thanks for joining us for this focus group. [Moderator introduces herself]. Today we'll be talking about how students use technology in the classroom and in the home, and any challenges they have encountered you are aware of. We'll also discuss your perceptions of children's attitudes toward privacy and security, as well as your experiences helping children navigate privacy and security online.

The format of this session is a focus group. I have a set of questions I'd like to open up to discussion, but there's no formal method for answering. I encourage everyone to share their thoughts. My role is merely to facilitate the conversation; you all will be guiding it.

This session is scheduled to last approximately 60 minutes. Does anyone have questions before we start? Can I also record our conversation for today? I want to assure you that whatever that is being shared in this room today stays with us, and anything we use from this conversation today to develop resources or publications will be using pseudonyms.

*[Open to questions]*

(1) Moderator: Great. Let's start with a quick warm-up activity. Could we go around the room and have each person share their name and what grade they teach?

*[Warm-up activity]*

(2) Moderator: OK, let's get started by talking a bit about the technology you use in the classroom. First, do you think kids have a good understanding of what privacy means, both on and off the internet?

*[Discussion]*

(3) Moderator: Do you know how technology and social media is used in the home?

*[Discussion]*

(4) Moderator: Do you think parents are usually aware of what kids are doing on their devices and on the internet?

*[Discussion]*

(5) Moderator: Do you think students are taught the importance of computer privacy and security at home?

*[Discussion]*

(6) Moderator: What are some issues you have experienced with kids not understanding privacy? For example, a case where a student did not keep another student's information private?

*[Discussion]*

(7) Moderator: What are some ways you've tried to resolve these issues? How well did they work?

*[Discussion]*

(8) Moderator: What do you hope kids learn about computer security and data privacy from the lesson plans we develop together?

*[Discussion]*

(9) Moderator: What are some methods you have tried in the past to teach kids about computer security and data privacy, if any at all?

*[Discussion]*

(10) Moderator: What is, in your opinion, the most important thing that students should understand about privacy and be involved in the lesson plans we develop?

*[Discussion]*

Moderator: Thank you again for your time today, which we know is very valuable. We appreciate your contributions and will be happy to share results from this project with anyone who is interested.