



Article

Exploring Parents' Technology Attitudes and Practices in the Context of School-Issued One-to-One Devices in Kindergarten

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Abstract: School districts are quickly adopting one-to-one mobile device programs for children as early as kindergarten, but evidence of successful device integration is mixed. One important area to consider is the home-school connection, i.e., the role of parents and the home environment in supporting or hindering children's school-based technology use. Previous research has looked extensively at teacher-related barriers and facilitators of classroom technology use, as well as parent-related barriers and facilitators of home technology use. However, the home and school spheres are highly interconnected, especially for young children. Therefore, this survey-based case study explored the relationships between children's at-home technology use, their parents' attitudes towards technology, and their in-school tablet use utilizing a sample of 258 parents of kindergartners in a racially and socioeconomically diverse district that had recently adopted a one-to-one tablet program. Results highlight the ubiquity of kindergartners' home device use and parents' general optimism towards both home- and school-based digital devices.

Keywords: parent attitudes; parental mediation; co-use; home-school connection; one-to-one devices; early years education



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1. Introduction

Trends in educational device adoption show that K-12 schools across the United States and many other industrialized nations are increasing their technology use dramatically (Cavanagh 2018). Many school districts have recently adopted one-to-one device programs, i.e., a personal tech device issued to each student, starting as early as kindergarten¹ (Vu et al. 2019). In 2018, researchers were predicting that by 2021, half of all K-12 school systems would equip their students with one-to-one devices, and about the same number would have more than one device per student (Cavanagh 2018). Then, the COVID-19 pandemic caused a rapid escalation of that rate of technology adoption during the 2020–2021 school year. Since this widespread technology adoption is a relatively new phenomenon, there is still much to learn about best practices for integrating devices into classrooms and into students' lives.

Researchers have begun to unpack the role of teacher attitudes in classroom technology integration (Blackwell et al. 2013; Cheng et al. 2020; Kadel 2005), but much less is known about the role that parents may have in their children's school-issued technology use. Early research on computer integration in classrooms found that in addition to support from teachers and school administration, parents' support of the technology was an important predictor of child success (Davidson and Ritchie 1994). Moreover, evidence suggests that parents' attitudes towards technology impact children's mobile device use (Sanders et al. 2016), which underscores the importance of understanding how parents perceive the rising use of mobile devices in homes and schools. While parents are provided with guidelines about managing screen use for their children outside of school (AAP Council on

[Communications and Media 2016](#)), there are currently no standard guidelines for parents that take in-school technology use into consideration. Likewise, there is no standard set of research-based best practices for educators and school administrators when it comes to including parents in their educational technology adoption plans. The current study was motivated by this need to better understand how to foster a positive home-school connection that supports the use of educational technology for early learning. As part of a larger research project on the impact of in-school tablet use on kindergartners' early math and literacy skills, the purpose of this study was to explore the relationship between children's home technology environment and their use of a school-issued tablet. Specifically, we sought to understand the nature of their at-home mobile device use, their parents' mediation strategies for technology use at home, and their parents' attitudes towards technology use both at home and at school.

2. Literature Review

2.1. Trends in Educational Technology Use

Mobile devices, such as tablets and smartphones, are now ubiquitously present in children's lives ([Rideout and Robb 2020](#)). As a result, mobile device manufacturers and app developers offer an abundance of educational tools children might use for early learning ([Singer and Ivory 2017](#)). In addition to the affordances of the devices themselves, there is a growing consensus that children need to be familiar with technology at a young age so that they can be equipped for an increasingly tech-based workforce. Thus, more and more districts are adopting one-to-one technology practices for their students starting as early as kindergarten ([McMahon 2019](#)). These policy changes are happening much more rapidly than related research. However, schools feel the need to keep up with the trends, and therefore many superintendents and principals have to make decisions about new technology practices without having supportive evidence in hand. While the possibility of transforming early learning supports via educational technology seem encouraging, supporting research in this area is still quite limited, especially research focused on in-school technology use (likely due to the constraints and limitations of conducting research within a school setting). There is reason to believe that one-to-one technology in schools could have positive effects, including bridging the digital divide and the specific affordances of interactive technology for learning, but very limited evidence on how best to support these new practices.

2.1.1. Bridging the Digital Divide

One of the reasons often cited by school districts for providing one-to-one access to devices is the desire to bridge the digital divide ([Judge et al. 2006](#)). Disparities in digital device ownership continue to exist depending on family demographics ([Ragnedda 2020](#)). For example, economically disadvantaged households are often far less likely to own a mobile device as compared with wealthier families ([Anderson and Kumar 2019](#)). However, access is not the end-all solution to equity issues; questions remain about how teachers use devices, the ability of available devices to provide equitable opportunities for engagement with productive applications, and the relationship of access to devices in school to home use of digital resources.

Many scholars have argued for moving beyond the term "digital divide" to other terms that more accurately describe the current state of our society. For example, [Carlson and Isaacs \(2018\)](#) make a case for focusing on "technological capital", i.e., "an individual's ability to benefit from their technological history", rather than the laser focus on access that is addressed by the digital divide literature. Similarly, [Dolan \(2016\)](#) suggests that instead of digital access being a binary of "haves" and "have nots", it is more a matter of "cans" and "cannots". In other words, children attending higher socio-economic status (SES) schools tend to become active users of technology, while children in more economically disadvantaged schools tend to be more passive engagers of mobile technology. Specifically, active users use devices to create, while passive users use devices in more drill and skill-

type activities (Dolan 2016). Teachers in higher SES districts might also receive more training on how to integrate new tech tools into their classrooms, resulting in more robust learning opportunities for their students. *Digital equity* in and out of schools is critical so that all children have access to *and* support in using digital resources, regardless of their positioning in society/race, class, gender, or language (Collin and Brotcorne 2019; Ragnedda 2020). In this study, we specifically focus on a school district that is racially, ethnically, and socioeconomically diverse, in order to explore the nature of a one-to-one tablet program in a setting where technological disparities were likely the norm.

2.1.2. Mobile Devices and Early Learning

Beyond bridging the digital divide, it is important to consider the particular affordances of tablets as educational devices. Although the potential for more traditional technologies, such as educational television, to have positive effects on children's early learning has been well established (Anderson 1998; Fisch et al. 1999), exploring the effects of mobile devices on early learning is an emerging trend in early childhood education research that has thus far shown mixed evidence.

In a systematic review of the literature, Herodotou (2017) found mostly positive outcomes across 19 studies that explored the impact of tablets on early learning outcomes. Several studies have found that mobile devices have the ability to motivate children and engage them in learning (e.g., Beschorner and Hutchison 2013; Plowman et al. 2012; Tavernier and Hu 2020). Young children generally find tablets easy to use, thus making for easily introduced learning tools in homes and classrooms (Couse and Chen 2010; Flewitt et al. 2015). Researchers have also found that with appropriate structures and supports, some apps can lead to demonstrated learning (e.g., Booton et al. 2021; Falloon 2013; Griffith et al. 2019, 2020).

On the other hand, Haßler et al. (2016) also conducted a systematic review and found mixed results in terms of the impact of tablets on learning outcomes in a variety of subject areas, finding some to be positive, some neutral, and some negative. In some studies, the subject matter seems to be the deciding factor; Javed and Samara (2019) found that children who used tablet devices in their classroom saw greater learning gains than their peers in non-tablet classrooms for English and Math, but not for learning their native language of Urdu. In other cases, however, even when the subject matter is held constant, the specific type of assessment can show differing results. In a study that looked at early STEM learning as the outcome of interest, Aladé et al. (2016) found that preschoolers who played an interactive measuring game on a tablet performed better on a near transfer task (i.e., mimicking the exact skill taught in the game), but children in the control condition performed better on a far transfer task (i.e., applying the skill to a novel context). Anderson and Davidson (2019) describe several studies that have shown similar patterns, where the tablets seem to aid learning in some specific ways but not in others. Another important variable is the way in which classroom devices are used; Taylor et al. (2020) found that classroom tablets had great potential for aiding in literacy outcomes, but that they were often used as mere substitutions for traditional paper-and-pencil tasks rather than in pedagogically informed way.

In sum, research from the past decade has illustrated that it is not enough to ask, "Do the tablets work or not?" Instead, we must ask, "In what specific ways can educational devices be useful, and how can we best harness their potential?"

2.2. Theoretical Frameworks That Speak to the Importance of the Home Context

While the evidence presented above does provide some encouragement for the potential of educational technology use in the classroom, it also points to the need for more nuance in investigations of children's learning from tablet technology. There is still much to learn about how these devices should be used and implemented in order to maximize positive effects and mitigate any potential negative effects. The context of a child's mobile device use—e.g., their prior experience, the environment in which they use the device, and

who uses the device with them—is an important part of understanding the impact that device may have (Guernsey 2007). Therefore, this study sought to learn more about the home context in a case where new classroom-based devices had been issued to kindergartners across a large urban school district.

2.2.1. Bioecological Theory of Human Development

Bronfenbrenner’s bioecological theory (Bronfenbrenner 1979, 1994) provides a useful framework for understanding the importance of considering a child’s environment when investigating learning outcomes. Bronfenbrenner frames aspects of the environment as “contexts” of a person’s development, from the microsystem, or the immediate surroundings, to the exo-, macro-, and chronosystem, or the broadest level of environmental and historical events. Mesosystems are characterized as the interactions between different micro contexts. For example, family and school are two important microsystems, but the interaction between those systems can be just as important as the influence of each system considered independently. Indeed, parental involvement in a child’s schooling is an important predictor of their academic success (Barge and Loges 2003).

Jordan (2004) suggests that in today’s media-saturated environment, technology might be an important consideration at every level of a child’s ecology, from the everyday interactions with parents that make up the microsystem, to the cultural influence of technology at the macro level. Recent reports show that 98% of children aged 0–8 live in a home with some type of mobile device (Rideout and Robb 2020), suggesting that mobile technology is indeed an undeniable part of most children’s microsystems. Children develop ideas of how to use and interact with media and technology by observing role models in their home environment, i.e., their parents, caregivers, and older siblings (Jordan 2004). Thus, when examining children’s technology or media use, it is imperative to look at the attitudes and usage patterns of others in their home environment.

Further, recent theorizing in the field of children’s technology uses Bronfenbrenner’s work to incorporate the “technological and virtual” contexts in which children exist (Navarro and Tudge 2022, p. 1). Navarro and Tudge contend that children navigate both physical and virtual microsystems. With the increasing presence of mobile devices in homes and schools, we must consider the interactions between children’s physical and virtual microsystems, which we aim to do in the present study.

2.2.2. Parental Attitudes towards Early Technology Use

Attitudes as a psychological construct are the evaluations of objects or of the outcomes of a given behavior. While the relationship between attitudes and behavior is complex, over 80 years of research have demonstrated that attitudes do systematically predict behavior (Fazio and Roskos-Ewoldsen 2005). For example, if you believe reading books with your child will help your child succeed in school and that your child succeeding in school is good and important, you have a positive attitude towards reading books with your child, and in turn, you are more likely to read books with your child. Likewise, parental attitudes towards children’s technology use impact the amount of time a parent spends using technology together with their child, which in turn impacts the child’s own relationship with technology. Several studies over the last decade, including two large nationally representative surveys of parents in the U.S., have found that parents’ positive attitudes towards mobile device use predicted the amount of time their children spent with digital devices at home (Cingel and Krcmar 2013; Lauricella et al. 2015; Lee et al. 2022; Pila et al. 2021). To expand upon that work and connect parent attitudes to school-based technology use, in the present study, we sought to understand parental attitudes towards children’s mobile device use across home and school contexts.

2.2.3. Parental Mediation and Co-Use

In addition to considering the indirect influence of parents’ attitudes toward their children’s media use, it is also important to consider the more direct influence that parents

often exert, often referred to as parental mediation. Historically, parental mediation of children's media use emphasized three types of interaction between parents and children (Nathanson 1999). Active mediation refers to parents discussing with children the media they have encountered, which, research suggests, can lead to more positive media use outcomes for children. Restrictive mediation refers to dialogue between a parent and child that is centered on rules and regulations regarding the child's media use. Finally, co-viewing, traditionally referring to television, involves a parent watching with their child. Clark (2011) argues, however, that a fourth strategy of parental mediation should be considered as a result of the current digital age. This strategy, called participatory learning, involves parents and children learning alongside one another, while centering the child's needs and interests (Clark 2011). This type of mediation includes using a device to facilitate learning through collaboration and contribution from both parties. Other scholars refer to participatory learning as co-use between parents and children (Beyens and Beullens 2017; Ewin et al. 2021; Wood et al. 2016). Due to the importance of parental involvement in a child's technology use, researchers have called for the creation of more targeted parental interventions to encourage media co-use, especially with young children (Connell et al. 2015). To date, parental mediation connected with classroom technology use is an unexplored phenomenon. Therefore, the current study also looked at the ways in which parents mediated their children's tablet use and the prevalence of co-use in our participants' homes with an eye toward contextualizing school-based tablet use.

2.3. The Current Study

Taken together, this review of the literature shows that while there is a great deal of evidence that parental attitudes and behaviors have a strong effect on child-level outcomes as well as a great deal of recent research attention on the barriers and facilitators of successful classroom technology integration, we know very little about the intersection of these two domains. The current study sought to explore the relationships between parental attitudes towards technology, children's at-home technology use, and children's school-based technology use, particularly in the context of a new district-wide one-to-one kindergarten tablet program. Prior to the start of this study, the authors' respective university units began a partnership with the local PBS affiliate station and the local urban school district. The agreement included providing educational, child-friendly tablets for every kindergartner in the district for three years. In turn, the district allowed university researchers to study the effects of the new program. The authors of this study took an interest in studying the contextual factors that might be at play. Specifically, we sought to understand the experience these children had with technology prior to the adoption of the new tablet program and the context of their tablet use from the perspective of the home environment. We posed the following research questions:

RQ1: What is the nature of children's technology use in the home context?

RQ2: What types of rules and structures do parents put in place for at-home mobile device use?

RQ3: What are parents' attitudes towards their children's mobile device use, both at home and at school?

RQ4: Are these rules, structures, and/or attitudes towards mobile device use moderated by demographic variables such as household income or parental education level?

3. Method

3.1. Design

Given the exploratory nature of our research questions and the naturalistic setting of the project, it was determined that a case study design would be most appropriate for this study (Baškarada 2014; Darke et al. 1998). More specifically, Gable (1994) makes a strong case for integrating quantitative survey research into a qualitative case study approach, and further, our research team comprised one primarily quantitative researcher and one primarily qualitative researcher, lending itself to the utilization of a mixed-method

approach. Thus, this study utilized a mixed-method, survey-based case study design. To explore our research questions, we surveyed parents of all kindergarten children in a large Midwestern school district that had recently adopted a one-to-one tablet program. The survey utilized both closed- and open-ended questions to ask parents about their children's access to technology at home as well as about their own attitudes towards technology use for early learning.

3.2. Participants

This study utilized a convenience sample of ($N = 258$) parents of kindergartners in a one-to-one tablet program. Our sample included a diverse representation of gender, race, and socio-economic status. Of the parents in the sample, 78% ($n = 201$) were mothers and 18% ($n = 48$) were fathers. The majority (79%) of respondents reported having an additional adult residing within the home. In terms of racial/ethnic identity, 66% ($n = 171$) of respondents identified as White, 20% ($n = 53$) identified as Black or African American, and 10% ($n = 26$) identified as Hispanic, Latino, or Spanish origin. Almost half (47%) of our sample had attained a high school diploma as their highest level of education, while 44% of respondents had attained an Associate's degree or beyond. Economic status varied widely among respondents with over half (51%) reporting an annual household income below \$50,000. Most respondents (78%) reported being employed at a paying job or being self-employed.

3.3. Procedure

As part of a larger project that took place from the fall of 2017 to the spring of 2020, each kindergarten child in a large, urban school district was given a child-friendly educational tablet to use in the classroom. Tablets were distributed in the fall of each school year, several weeks after the school year began. Teachers of these kindergarten classrooms were encouraged to have their students use the tablets for at least 15 min daily. Otherwise, they were given the freedom to incorporate the tablets into their classrooms however they saw fit. Children were given tablets to take home at the end of the school year.

In the spring of each school year, prior to the tablets going home for the summer, our survey was distributed to the parents of all kindergartners in the district. After approval by the Institutional Review Board, the survey was emailed to parents by district personnel on behalf of the researchers. A reminder to complete the survey was sent out approximately two weeks after the initial email. Surveys were completed online using Qualtrics survey software. To encourage participation, parents were offered a \$10 electronic gift card as compensation for completing the survey.

This process was repeated over the course of two school years. (Though tablets were distributed during the third year of the project; data were not collected that spring due to the COVID-19 pandemic.) Out of approximately two thousand parents, two hundred fifty-eight completed the survey, resulting in a response rate of 13%. Despite this relatively low response rate, having data from across two years of the program allowed us to gain insight from a very diverse group of parents, and allowed us to check for any differences by cohort. Participants from the two cohorts did not differ on any of the variables that were included in the survey.

3.4. Measures

The survey included questions about family demographics, home technology access and use by the child, and parent attitudes towards technology use at home and in school. Following standard survey procedures (e.g., [Wartella et al. 2013](#)), at the beginning of the survey, after providing informed consent, parents were asked to provide the date of birth and gender of their child who was currently enrolled in kindergarten. They were asked to consider only that child when answering the remainder of the survey questions.

The survey began by asking about general technology access and use at home. Parents were first asked to report which types of technology were present in the home (i.e.,

smartphone, tablet, laptop computer, desktop computer, wireless internet) with examples of each type. They were then asked to report which of those technologies their child used at least once per week.

The next set of questions asked specifically about mobile device use by the child. Parents were asked to report how many days in the past week their child had used a mobile device (smartphone or tablet). They were then asked how much time per day, in hours and minutes, their child spent using a mobile device, on average in the past week. Parents were then asked to select all activities the child typically does on the mobile device: watching TV shows/movies, watching YouTube, reading e-books, playing educational apps, playing entertainment apps, messaging with text or email, video chatting, and searching for new information. Examples of apps/programs were provided for each. Additionally, parents were asked to provide an open-ended response to the question, "What are your child's favorite apps to use on the mobile device?"

To address co-use and parental mediation strategies, we asked how much of the child's time spent on a mobile device was spent using that mobile device together with another family member (response options ranged from "all of the time" to "none of the time"). We also asked who generally decides which apps the child will use: primarily the parent, primarily the child, or the parent and child together. Finally, parents were asked to "tell us any rules or expectations you have around your child's mobile device use at home" (open-ended).

Parents were then asked about their attitudes towards technology use on a 4-point Likert-type scale ranging from "Strongly Agree" to "Strongly Disagree." *Attitudes towards mobile device use at home* consisted of the following five items: "Having a mobile device in the home makes my job as a parent easier", "My child learns a lot when they use the mobile device", "My child enjoys using mobile devices", "I enjoy using the mobile device with my child", "I am concerned that my child uses the mobile device too much" (reverse coded). Item-Scale Correlation for the last item was low, so it was treated as a separate variable for analysis. Reliability for the four-item scale was good, with $\alpha = 0.67$. *Attitudes towards mobile device use at school* consisted of the following five items: "It is important for children to learn how to use technology in school", "Technology use in school distracts from learning" (reverse coded), "There can be a healthy balance between traditional teaching methods and teaching with technology", "Tablets can be a useful learning tool at school", and "Tablet use takes away from other more important learning" (reverse coded). Reliability for the five-item scale was good, with $\alpha = 0.70$.

4. Results

4.1. Nature of Technology Use in the Home

4.1.1. Access to Technology

Parents reported having a variety of technological devices in their homes (see Table 1). The vast majority of respondents (95%) reported owning a smartphone. Most also owned tablets (81%) as well as laptop computers (70%). Eighty-seven percent of homes had Wi-Fi service; while this number is relatively high, many argue that Wi-Fi should be considered a public utility, such as electricity and water. Therefore, 13% of homes lacking Wi-Fi service are an important and sizeable minority to consider.

Table 1. At-Home Technology Access and Use by Kindergartners.

Type of Technology	Access in the Home	Used by Child Weekly or More
Wi-Fi	87.2%	64%
Smartphone	96.1%	50%
Tablet	81.8%	68.2%
Laptop	70.5%	9.7%
Desktop	32.2%	8.9%

Device use within the home among their kindergarten children varied. While almost all respondents owned a smartphone, only half reported their child uses it regularly. More children used Wi-Fi (64%) and tablets (68%) at least once per week. The frequency of mobile device use by the children in our sample varied greatly, with participants reporting anywhere from 0 days to 7 days per week, ($M = 3.69$, $SD = 2.17$). Daily time using a mobile device also varied greatly, ranging from 0 h to 6 h total per day, with an average of 1 h and 41 min per day.

4.1.2. What Do Children Do on Mobile Devices?

There were clear patterns of popular and unpopular mobile device activities amongst the children in our sample (see Figure 1). The majority of parents reported that their child plays educational apps (78%) and watches YouTube videos (67%). About half also spend time playing entertainment apps and watching television shows or movies. Less than a quarter of children were reported to read e-books on their mobile devices or use video chat platforms, such as FaceTime, to communicate with others. Very few children were reported to use their mobile devices to search for new information or send messages to others.

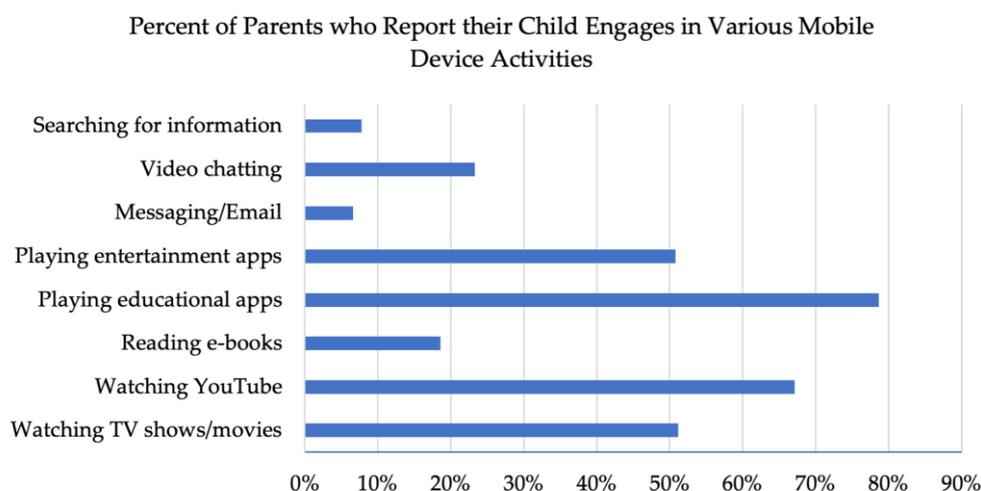


Figure 1. Activities Kindergarten Children Engage in While Using Mobile Devices.

When asked about their children's favorite apps, there were some consistent patterns about the types of apps, and there were a few apps that were used by many of the respondents' children. As seen in previous research on young children and apps (Nevski and Siibak 2016), video-watching was very popular among our respondents' children. Out of 245 responses to this question, 194 parents (79%) listed video-viewing applications, such as YouTube and Netflix, as their child's favorite apps. Out of the video-viewing apps, YouTube and YouTube Kids were listed the most frequently, with 46% of respondents reporting these apps as their child's favorite. PBS Kids (21%) and streaming services such as Netflix (12%) were also popular.

Second to video viewing apps, games were the next most common type of favorite app reported by parents. Forty-two percent of parents listed "games" in general, or specifically listed entertainment games, such as Slither.io or Angry Birds, as their child's favorite. Additionally, 25% of parents listed "educational games" or "learning games", such as ABC Mouse or "reading games" as their child's favorite apps.

4.2. Co-Use and Regulation of Mobile Devices in the Home

4.2.1. Co-Use

Results suggest that families vary in terms of whether their child uses a device (tablet or smartphone) independently or with another family member (see Figure 2). Over half (53%) of parents reported that the kindergartners use a device with a family member "some

of the time”, while 35% use the device with a family member “all” or “most of the time.” Ten percent of kindergarten children always use the device independently, without a family member. Additionally, 56% of parents reported that they share decision-making with their kindergarten children when it comes to which app to use. Over a quarter (27%) of parents reported that they solely make the app use decisions, while only 12% of parents stated that the child decides on their own which app to use.

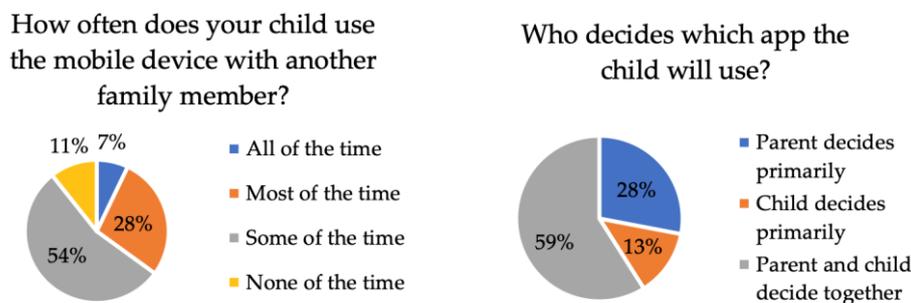


Figure 2. Co-Use and Parental Regulation of Mobile Devices.

4.2.2. Rules and Structures for Children’s Device Use

The survey also asked parents to share any rules or structures they had put in place concerning their child’s mobile device use. These open-ended data were recorded and then tabulated to look for patterns and trends. Implementing time limits was the most common strategy, with 37% of the 245 parents who responded to this question reporting some sort of time limit for their child’s device use. Over a quarter (27%) of respondents require that their child seek parental approval before using tablets at home. Fewer parents (18%) mentioned requiring their child to use age-appropriate applications, and some parents (14%) also said that their child must do their chores before they can use technology, such as cleaning and doing their homework before tablet time. A minority of parents (11%) mentioned that their child must use a device within the proximity of an adult, and 9% of parents reported that their child must display “good behavior” as a prerequisite for tablet use.

4.3. Parent Attitudes towards Device Use

4.3.1. Parent Attitudes towards Device Use in the Home

When asked about their attitudes towards mobile device use within the home, respondents were overwhelmingly positive (see Figure 3). Sixty-seven percent of parents strongly or somewhat agreed that having a mobile device in the home makes their job as a parent easier. The vast majority of parents (96%) either strongly or somewhat agreed that their child enjoys using a mobile device at home, and 85% of respondents somewhat or strongly agreed that they enjoy using a mobile device with their child. A large majority (82%) of parents somewhat or strongly agreed that mobile devices help their children learn at home. However, a sizable minority (14%) somewhat or strongly disagreed.

Despite these positive attitudes, there was also some widespread concern about too much use. Forty-one percent of parents somewhat or strongly agreed that they were concerned about their child using mobile devices too much. However, over half of the respondents somewhat (30%) or strongly (24%) disagreed.

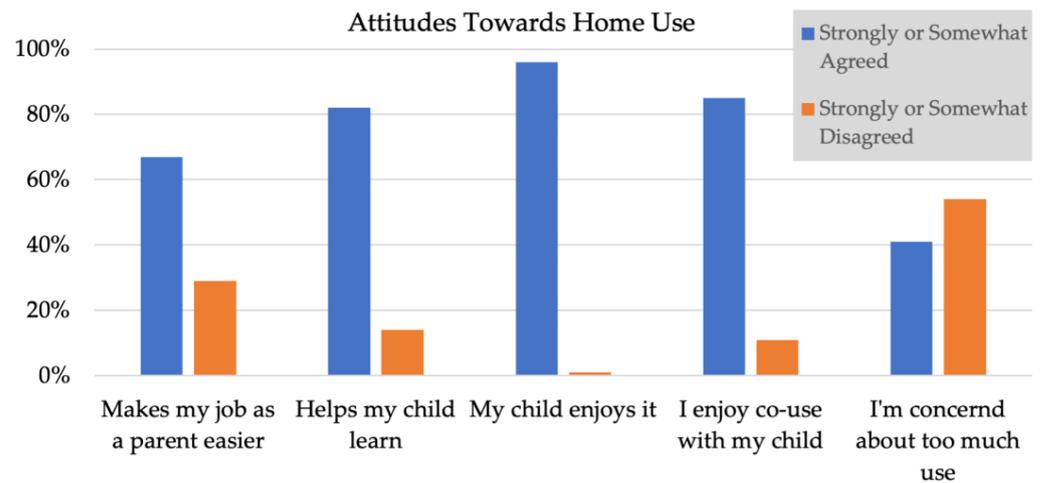


Figure 3. Parent attitudes towards at-home technology use by their kindergarten children.

4.3.2. Parent Attitudes towards Device Use in School

Overwhelmingly (92%), parents agreed that it is important for children to have access to technological tools in the classroom (see Figure 4). Moreover, 96% of respondents agreed that mobile devices are useful learning tools within classrooms. Parents also held positive attitudes towards balancing traditional teaching methods with technology-based methods; 94% of respondents agreed that a healthy balance is possible. Parents’ attitudes about the potential negative impacts of technology use in classrooms varied widely. Over a third (38%) of respondents agreed or strongly agreed that technology can distract from learning, while 58% of participants disagreed with that statement. Similarly, while 21% of respondents believed that technology use in classrooms takes away from important learning, 74% disagreed.

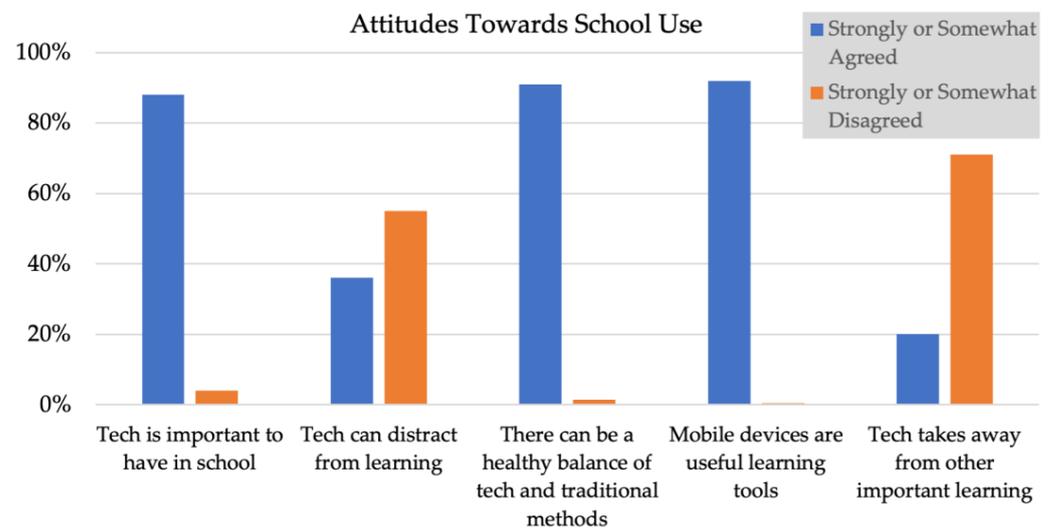


Figure 4. Parent attitudes towards in-school technology use by their kindergarten children.

4.4. Demographic Moderators

Additional Thoughts

At the end of the survey, parents were given the opportunity to report any additional thoughts they had about the tablets or the schools’ tablet initiative in general, and just over a third ($n = 87$) provided a response. Parents’ responses were generally positive in nature. About half of the respondents to this question (49%) expressed approval of their child’s use of the tablet. Additionally, parents remarked that their child enjoys using tablets (34%) and

that technology exposure is important for children (17%). Over half (51%) emphasized that tablets make good learning tools for their children.

On the negative side, 10 parents (11%) made a point to express dissatisfaction with the lack of communication from the school about the tablets. One parent remarked, “I would have liked to have known what it was being used to enforce or learn.” Another parent noted, “I would have liked more information about how they were being used—i.e., what is the frequency? What concepts or skills did they used to teach? How were outcomes measured or recorded?” A recurrent theme was that these parents would have appreciated the school giving more communication about how the tablets were used in school.

5. Discussion

Results from this survey-based case study present a snapshot into the lives of parents and children within a racially, ethnically, and socioeconomically diverse school district at a very particular, yet highly relatable, moment in time—right after their school district implemented a one-to-one tablet program. As more and more districts across the country adopt similar one-to-one device programs for their early years’ students, it is critical that we continue to understand the barriers and facilitators of successful device integration. For young children especially, the home environment is an important context to consider when seeking to understand the effects of a new educational program (Bronfenbrenner 1994). Therefore, this study explored the context of the home technology environment in relation to the adoption of new school-issued devices.

To that end, the first specific goal of this study was to document the at-home technology landscape that children in the district were coming in with (RQ1). Access to mobile devices was ubiquitous across most homes in our sample, yet in terms of time use, the survey findings revealed differences depending on the type of platform. Only about half of the respondents reported that their child uses a smartphone at least once per week, despite the majority of families owning at least one. On the other hand, more parents reported that their children used Wi-Fi and tablets in the home frequently. These findings support the more recent trend towards looking at the digital divide in terms of skill and quality of use rather than in terms of access (Collin and Brotcorne 2019; Gran et al. 2020). Findings about daily time spent with mobile devices were also in line with recent national reports of young children’s mobile device use (Rideout and Robb 2020).

In addition to access and time spent with various devices, we also explored *how* children spend their time on mobile devices. First, we asked parents to indicate what types of activities their children engage in while using mobile devices. The most common activities were watching shows and movies or YouTube videos as well as playing both educational and entertainment games. In an effort to glean more specific information on children’s mobile device activities, we asked parents to report their children’s favorite apps. Interestingly, video-viewing apps were the most popular among the respondents’ children. YouTube and YouTube Kids were the most popular video-viewing apps, while more educational programming, such as PBS Kids, was listed less frequently. In the same vein, “educational” or “learning” games were less popular among children than games in general. This is somewhat contradictory to the parents’ reporting of educational games as an activity their children consistently complete in the closed-ended section. Together these findings suggest that there may be some discrepancy between children’s favorite apps and the apps that parents frequently allow/encourage their children to use. Other recent studies have also found that educational apps, specifically ones that teach literacy, are best sellers globally (e.g., Sari et al. 2019), but our data suggest that just because parents are buying them, this does not mean that children are using them with the same frequency as their parents might hope. Future work might continue to investigate the underlying mechanisms behind this type of discrepancy.

In terms of co-use, findings revealed wide variance between families. For example, about half of the respondents reported their child uses mobile devices with a family member “some of the time”. It may be that the occurrence of co-use is dependent on the purpose of

the child's use. For example, if the child is using it for entertainment purposes, it could be an opportunity for the parents to complete work or chores within the home completed. Previous research findings suggest that parents see their children's device use as a way to help them have time to get chores completed (Cingel and Krcmar 2013), which might be the reason that parents reported using a device with their children "some of the time" in the current study. Future research should continue to explore the nature of the co-use among parents and children when it comes to the use of school-issued technology. For example, the co-use might have included the parent co-viewing alongside their child or could have taken on a more participatory learning activity, where the parent is involved in the learning taking place (Clark 2011).

Endeavoring to explore potential forms of parental mediation (RQ2), we also asked parents to describe any rules, structures, or expectations they have for their child's at-home tablet use. Almost every respondent listed at least one rule or expectation they implement at home, which suggests that parents of kindergarten-age children are involved in mediating their children's technology use. The most common rule among parents was establishing time limits. This is likely due to recommendations from the American Academy of Pediatrics (AAP), which are very commonly referenced by pediatricians as well as in the popular press. Up until very recently, these recommendations focused only on quantity rather than the quality of screen time. However, many scholars argue that time use is not a particularly helpful way to think about children's screen time these days and that instead, parents should concern themselves more with the quality of screen time rather than the quantity (e.g., Daugherty et al. 2014; McClure 2018). While there is a large body of work on parental mediation of traditional media such as television and a growing body of research on the mediation of home-based mobile devices, we do not yet have much evidence of how parents may or may not change their mediation strategies when it comes to school-issued devices being brought home, and so it is difficult to provide a true comparison point for these data. That said, the parental mediation strategies highlighted in our data seem to be most in line with restrictive mediation, i.e., setting in place rules and boundaries (Clark 2011; Nathanson 1999).

In terms of parent attitudes (RQ3), overall, the parents in our sample reported feeling very positive about their children's technology use. Despite reporting some concern that their children might be spending too much time with technology, overwhelmingly, parents expressed support for children's use of technology both at home and at school, especially important to the issue of technology integration in schools. Parents agreed that educational tablets can be effective tools for early learning in classrooms. The positive attitudes of parents in our sample are in line with other recent national studies, which showed that parents of young children today, who are generally Millennials that grew up using technology from a young age, held very positive views of their children's technology use (Rideout and Robb 2020).

It is important to keep in mind that these parents had not been consulted about the school district's decision to give a tablet to every kindergartner. Due to this fact, we expected that some parents might have negative attitudes towards their children using technology in school and/or might curtail their use at home. On the contrary, our data here suggests that parents felt overwhelmingly positive about the school district's decision and did not express many concerns about their children's technology use at home or at school. Interestingly, this finding is in direct opposition to another recent study that found strong resistance from parents to the use of smartphones in school for educational purposes (Hadad et al. 2020). Despite the fact that tablets and smartphones share many of the same affordances, it may be that parents attribute very different qualities to tablets and smartphones. This should certainly be explored in future research.

5.1. Practical Implications

In thinking about ways to support and enhance the positive effects of one-to-one device programs for young children, school districts such as the one we studied might

consider several highlights from this study. First, they should strive to understand the prior experience that their students have with devices similar to the ones being adopted. Prior experience and prior contextual knowledge have been shown to be important predictors of learning from technology (Aladé and Nathanson 2016; Garcia 2019), and the data here illustrate that children in socioeconomically diverse districts may be coming in with widely different levels of experience. Understanding those discrepancies in prior experience should be included in any professional development programs for teachers who are tasked with integrating one-to-one devices into their classrooms. Districts might also consider communicating with parents about the importance of co-use and of active rather than restrictive mediation strategies. Our data showed that few parents were utilizing these strategies, which have been shown to be highly effective for mitigating the negative effects of children's technology use and enhancing positive effects (Beyens and Beullens 2017; Clark 2011; Wood et al. 2016).

5.2. Theoretical Implications

In terms of advancing theory, this study provides an important step toward connecting the home environment and the school environment in terms of children's technology use. Epstein's theory of overlapping spheres (Epstein 1987) serves as a model of how families and schools can work in tandem in support of children. One sphere represents families, while the other represents schools. Due to the nature of the ever-changing lives of families and changing schools, the spheres overlap, and the degree of their overlap varies based on time, experiences in school, and experiences at home. The nature of family and school interactions will change, increasing and decreasing, throughout a child's schooling. Epstein explains that in the early years, schools and families having greater overlap in spheres is the most beneficial for children. This theoretical model could certainly be applied to the children's use of educational technology, suggesting that the connection between home and school is an incredibly important one that researchers should continue to consider when looking at the effects and effectiveness of educational technology.

5.3. Limitations and Areas for Future Research

This study relied on self-reported data from parents and thus may be inherently biased due to psychological issues, such as social desirability and cognitive dissonance. For example, since parents did not have a say in whether their children would receive these tablets, they may have implicitly adopted more favorable attitudes towards the technology in order to avoid feelings of dissonance. In the future, this type of data should be coupled with observational measures to ensure validity. The digital nature of the survey instrument may have also skewed our sample such that parents who do not have reliable internet access at home and/or who do not feel efficacious in their internet skills may have chosen not to respond to the survey request. Future research in this area should include in-person or paper-and-pencil survey options to ensure that parents with differing attitudes toward technology are not systematically excluded.

Additionally, the sample used in this study was a relatively small convenience sample, and thus results may not be generalizable to the district at large or to a national parent population. Though we drew from a very diverse school district (as of 2021, families in the district were 39% Black/African American, 23% White/Caucasian, 20% Hispanic/Latino, 11% multiracial, 6% Asian/Pacific Islander, and 1% Native American), our sample includes a disproportionately high level of White/Caucasian respondents (66%) and underrepresents Black (20%) and Hispanic (10%) families in the district. Therefore, the findings presented here may be skewed toward a White perspective. That said, compared to the general U.S. population, our sample is quite racially diverse, and thus adds important benchmarks to the literature in this area. The racial and economic diversity of our sample is evidenced by trends in our data compared to national reports. For example, the average for daily mobile device use in our sample (1 h 41 m) is more closely aligned with the national average for Black families (1 h 44 m) than the national average overall (52 m) reported by Rideout and

Robb in their 2020 Common Sense Census report. Likewise, the rate of household internet access in our sample (78%) is more closely aligned with what [Rideout and Robb \(2020\)](#) report for “lower-income households” (74%) than for “higher-income households” (95%). Unfortunately, due to our relatively small sample size, we were not able to investigate demographic differences in our patterns of findings. Future research should seek to add to our understanding of the ways in which different cultural, gender-based, and geographic differences might play into the home-school connection when it comes to technology use.

Given that (a) our study took place in a mid-sized, Midwestern, semi-urban area, (b) our sample was racially, ethnically, and socioeconomically diverse, and (c) that school districts all over the country have been adopting similar programs, we feel confident that the implications of our findings are relevant to many parents, children, educators, and researchers in the United States and in any similarly industrialized Western nation. Moreover, beyond sheer generalizability, we were interested in studying parents who were in the very particular position of having tablets given to their children, without their consent. (To be clear, parents did consent to take part in the research component of this study, but the decision to give each kindergartner in the school district their own personal tablet was one made by the school district administrators without input from the parents.) As more and more districts make these sorts of decisions, researchers should continue to gain a deeper understanding of the role that parents play. Additional qualitative methodologies such as focus groups and/or ethnographic research would be a rich way to supplement the quantitative data presented here.

6. Conclusions

Despite its limitations, this study presents important information to consider in light of recent trends in education. With the ubiquity of mobile devices, not only are young children using technology for many hours a day outside of school, but in many districts, they are beginning to use personal devices during the school day as well. These home and school environments are inextricably connected, and, therefore, we cannot look at the effects of educational technology in a vacuum.

From this study, it is clear that most parents feel positive about technology being used in school and at home, but also express some concerns about too much screen time. School teachers and administrators should communicate with parents about how much time children are spending with devices during the school day and on what types of activities so that parents can make at-home technology decisions that complement the in-school device use. When considering new device programs, schools also should consider the fact that not all households have internet access, and, therefore, devices meant to travel with the child between home and school may have limited utility in the home. School-issued mobile devices present many exciting opportunities, but their potential cannot be fully reached without considering the role that parents and the home context play.

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Note

¹ In this paper, we use the term “kindergarten” to refer to the year of schooling before compulsory formal education begins, typically for children around age five. Though it goes by many other names in other countries, this transitional year meant to help young children adjust to formal schooling is common around the globe.

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