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**Saudi Parents' Perspectives on the Use of Touch Screen Tablets
for Children with Learning Disabilities**

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Abstract

The current research is an exploratory, qualitative study of Saudi parents' perspectives on the use of touch screen tablets (i.e. iPads) to enhance learning outcomes for children with learning disabilities (LDs), ages 6-8 years. We conducted semi-structured interviews with 14 Saudi parents whose children with LDs used iPads for learning purposes. The results suggest that Saudi parents perceive this technology positively. However, the results also indicate that parents need guidance to support their child's use of this technology. Finally, the current study suggests the value of research investigating a broader array of parental perceptions of digital technology, as educators and policymakers incorporate digital technology into mainstream and LD education.

Key words: touch screen tablets; learning disabilities; parental perceptions; Saudi Arabia; early childhood education

Saudi Parents' Perspectives on the Use of Touch Screen Tablets for Children with Learning Disabilities

Introduction

As a result of the recent introduction and general acceptance of touch screen tablets (TSTs) (i.e. iPads; Murray & Olcese, 2011), children are increasingly exposed to these devices in school and at home (McManis & Gunnewig, 2012). TSTs are lightweight, mobile, and often have a wider screen (17-25cm) than desktop computers. In addition, TSTs detect and accurately respond to finger taps and touches (Neumann, 2014). These features make TSTs different from the standard desktop, the latter with many components and which requires advanced keyboard and hand-eye coordination skills (Holloway, Green, & Brady, 2013; Cooper, 2005). Tahnk (2011) adds that the TST multimedia interface results in more effective engagement through stimulating the child's kinaesthetic, visual, tactile, and auditory senses, affording immediate feedback.

Although much research has investigated the impact of media such as television, cell phones, and the Internet on adolescents' and children's socio-emotional and cognitive development and health (Strasburger, Wilson, & Jordan, 2013; Calvert & Wilson, 2010), little research has addressed the impact of TST use on young learners (Istemic Starcic & Bagon, 2014; Crescenzi, Jewitt, & Price, 2014). These studies focus on the primary years, elementary school, and tertiary education (e.g., Haßler, Major, & Hennessy, 2016; Nolan & McBride, 2014). Among these studies, few (e.g., Ok & Bryant, 2016) focused on children with learning disabilities (LDs).

There is an emerging body of research on the use of recent technologies, such as TSTs, among primary school learners. Several studies have investigated the use of such devices to facilitate acquisition of literacy skills. For example, in a study of first-graders, Dobler (2012) found that learners using TSTs worked together successfully and without

teacher intervention. In another study, Clarke and Abbott (2016) investigated the impact of TST use in numeracy, literacy, and learning skills in the primary school setting. For all participating children, including those with probable LDs, teachers observed greater learning readiness and improvements in understanding of numeracy and literacy concepts. The teachers also concluded that concentration, motivation, and confidence improved in all children as a result of guided work with TSTs. A study by Chai, Vail, and Ayres (2015) focused on the use of a specific TST application to teach young learners with LDs the skill of identifying phonemes, concluding that the children enjoyed using the TST, leading to improved performance.

In comparison to their peers without LDs, children with LDs often confront unique challenges when learning in a classroom environment. The allocation of assistive technology (AT) such as TSTs is one of the ways schools have attempted to support learners with LDs. Such devices enable learners with LDs to interface with the material in a manner that facilitates better comprehension and thus improved skill acquisition (Rapp, 2005). AT leads to a better understanding of educational materials for adolescents with LD (MacArthur & Haynes, 1995). In addition, AT affords learners more independence, typically resulting in further learning opportunities (Garner & Campbell, 1987).

Compared to learners without LDs, those with LD report lower self-esteem, which can interfere with academic performance (Di Giunta, Alessandri, Gerbino, Kanacri, Zuffiano, & Caprara, 2013) and physical and mental health (Trzesniewski et al., 2006). For individuals with LDs, AT such as TSTs can have a positive effect on self-perception. For example, Chiang and Jacobs (2009) found that learners with LDs who made use of text-to-speech software showed improved reading capabilities following the use of AT for 10 weeks. In a subsequent study, Chiang and Jacobs (2010) found that children with LDs who used AT showed improvements in reading comprehension, focus, and pronunciation after six months.

Other improvements included reading speed, quality, and quantity (Chiang & Jacobs, 2010). The learners' perception of ease and speed of their reading also was improved by use of AT software (Chiang & Liu, 2011).

From a sociocultural viewpoint (Vygotsky, 1978), learning for young children is facilitated when they interact with peers using cultural implements such as digital devices (Stephen, Stevenson, & Adey, 2013). In the early development of literacy in children, parents play an important role insofar as they can affect the type of experience that children will have with technology at home (Plowman, Stevenson, McPake, Stephen, & Adey, 2011). Studies focusing on children's use of digital technology in the home show that parents report a range of perspectives with regard to the use of such devices (O'Mara & Laidlaw, 2011; Green, Orwitz, & Lim, 2009; Plowman, Stevenson, McPake, Stephen, & Adey, 2012). In some families, for example, more traditional activities like playing with toys, reading a book, and outdoor activities, as opposed to digital activities, are encouraged (Plowman et al., 2011). In other families, parents report that there can be a healthy balance between the use of digital devices and other activities (Plowman et al., 2012). Exploring the perceptions of parents about the use of TSTs and how they are related to emerging skills in literacy could provide insights into the role played by TSTs in facilitating literacy.

The dearth of studies investigating the effect of TSTs, including iPads, tablets, and smartphones, on young learners is widely acknowledged (Herodotou, 2018). There is a need for research into the role these technologies might play in primary school learners with LD, in particular. Thus, the current study intended to contribute to this area of knowledge by addressing perceptions of parents with regard to the use of TSTs in enhancing learning outcomes for learners with LDs. The focus on parents follows from the recognition that they play an important role in the provision of opportunities for children to use these technologies

at home, which can in turn affect learning (Stephen, Stevenson, & Adey, 2013; Plowman et al., 2011).

Educational initiatives are more likely to succeed with parental involvement and support, and yet previous research has not considered parents' perspectives on the use of such devices in assisting young children with LD. What little research has been done has focused on Western parents and children (Chmiliar, 2013; Papadakis & Kalogiannakis, 2017); no previous research has investigated perceptions of Middle Eastern parents, such as Saudi parents. The current research is an exploratory study of Saudi parents' perspectives on the use of TSTs to enhance learning outcomes for children with LD, ages 6-8 years. We sought to address the following research questions: What is the perception of parents regarding the use of TSTs in the education of children with LDs? What are the advantages and disadvantages, as perceived by parents in Saudi Arabia, of using TSTs as a learning tool in the education of children with LDs? And, finally, what are the suggestions of Saudi Arabian parents regarding the use of TSTs as a learning tool for learners with LDs?

Method

Design

This study employed a qualitative design in service of exploratory research. Qualitative data were secured with semi-structured interviews of Saudi parents of young learners with LD to identify their perceptions of their child's educational use of TSTs. A qualitative design allowed us to investigate specific parental perceptions and to follow-up as needed to clarify or pursue additional elements of parental perceptions (Creswell & Creswell, 2017).

Participants

To increase geographic, demographic, and class diversity of the sample, directors of elementary schools located in all four city quarters of Jeddah, Saudi Arabia, were alerted to

the study, and encouraged to alert parents of children with LDs to the research opportunity. Fourteen parents (nine mothers and five fathers) agreed to be interviewed. The demographic information available for the participants is displayed in Table 1.

Procedure

The XXX University Research Ethics Board approved this study. Once parents had been provided with an information letter and offered the opportunity to discuss the study with the researcher, they signed a statement of informed consent to participate. The school directors assisted with participant recruitment, as indicated above. Prior to initiating the study, collaboration and permission were sought and obtained from the Jeddah local education authorities for the participating schools.

Semi-structured interviews have the flexibility of an unstructured interview, allowing for extended discussions and permitting participants to provide details about their personal experiences and opinions, while also having beneficial features of a structured interview such as focused questions asked in an organized way (Newby, 2014). The semi-structured interview methodology used in the current study has been used successfully in previous family studies addressing early childhood education (e.g., Geer, White, Zeegers, Au, & Barnes, 2017; Lu, Ottenbreit-Leftwich, Ding, & Glazewski, 2017).

Interviews were conducted either by phone or in person by the first author in a location selected by the parent. Each interview was approximately 35 minutes in duration, and were guided by four questions: (1) What is your view regarding the use of an iPad as a learning tool for children with LDs? (2) What do you see as advantages of using an iPad as a learning tool for children with LDs? (3) What concerns do you have about the use of an iPad as a learning tool for children with LDs? (4) What suggestions do you have regarding the use of an iPad as a learning tool for children with LDs?

Data Analysis

Each interview was recorded and transcribed. Following Li and Liu (2017), transcribed data for each interview question were organized with the software program NVivo to identify thematic categories for responses (Braun & Clarke, 2006), after which responses were coded according to the identified themes. Three main themes were identified, as reported below.

The data for this study were considered with qualitative methods. Before the data were collected and the coding process established, the researchers began with a coding scheme based on the research questions. These codes were developed into themes. In the following, illustrative responses are quoted to communicate the narrative quality and tone of parental perceptions. In general, participants perceived TSTs positively as a learning tool for their young children with LDs. They reported that technology has become an integral part of the daily life of their children.

Results

The key results are discussed according to the three themes identified in the responses: Advantages of Using iPads, Disadvantages of Using iPads, and Parents' Suggestions Regarding iPad Use by Children with LDs.

Advantages of Using iPads

In general, parents reported positive attitudes and perspectives with regard to iPad use as a learning tool for children with LDs. One of the parents (parent 14) stated that:

“It is a really helpful tool that is available in every house with the capability to strengthen learning and makes it easier to improve learning as play rather than learning especially if I consider that my child does not have the desire to learn.”

Another parent (parent 9) agreed, noting that:

“My child thinks he is playing. It is even better and easier and loved more than computers; it is interactive and provides feedback.”

Another parent (parent 8) commented that:

“It provides learning without judgement and gives children with learning disabilities a sense of inclusion because it is very positive in terms of attaining engagement as well as interaction.”

Other parents offered the following comments about the use of an iPad, specifically in the home environment:

“Very useful in the home environment. My child independently uses the apps and shows a willingness to share the use of the iPad and further share what he has been working on” (parent 5); “The information is available at any time the child needs, which helps him retain the information” (parent 7); “I like the necessity of completing tasks by completing one level in a game or educational program before he moves to the next level” (parent 12); “My son enjoys learning on the iPad. A number of learning developments are witnessed, such as in his ability to read and learn math” (parent 5); “Self-talk is used during iPad use, with creative play and construction during learning, which improves other non-academic skills such as social skills. There has been a significant development in his language ability. I believe that if these devices are used to improve verbal skills, the child could communicate with his friends and relatives through communication programs” (parent 10); “It allows children with LDs to develop the skills to deal with new technology and be up to date” (parent 1).

All participating parents, including those with children with Attention Deficit Hyperactivity Disorder (ADHD), commented that children are able to maintain attention and concentration when completing learning activities on the iPad, with the duration exceeding that of classroom activities. As one parent (parent 4) noted:

“Children with attention deficit can use the device even with the problems of their lack of attention. For example, my child was successful in overcoming her attention problems and could pay attention for a longer time using the iPad.”

Disadvantages of Using iPads

Parents were not uniformly positive about the use of iPads by their children with LDs. Parents noted several negative features or disadvantages of iPad use. For example, many parents voiced concerns about the cost of purchasing an iPad for their child to use at home. Another key challenge identified by several parents was the need to monitor iPad use to ensure children were using the iPad for its intended educational purpose. These same parents noted that it was not possible for them to provide continuous monitoring, and this was a cause for concern—a disadvantage of iPad use by their children.

A further disadvantage parents identified was the requisite time and attention for setting up the iPad for use by their children, and for searching, installing, and updating or uninstalling educational applications:

“Setting up the iPad and installing applications was time-consuming” (parent 11);

“Much time was needed when it came to sourcing new apps and choosing which ones to use” (parent 7).

Another problem mentioned by most parents was limiting their child’s time on the iPad. As one parent (parent 2) stated:

“My daughter became attached to the device; she was reluctant to give up the iPad.”

Another parent (parent 4) commented:

“Among the most prominent negatives that can affect children as a result of using the iPad, whether for education or play, is that it is used by the child on his own, and thus he lacks the intimacy of real relationships with real friends away from the digital world.”

Parents mentioned other concerns, such as that excessive use of digital devices might cause developmental delays or social-emotional problems related to social isolation. For example, one parent (parent 10) commented that:

“Technology pushes the child to be alone and isolate himself from his family and friends, and it involves a virtual electronic world, so you find that he spends hours in front of the iPad screen, either to watch videos or play games. Consequently, the child prefers to spend most of his time with electronic devices instead of spending time with his family.”

Other problems mentioned by parents included: health concerns; as one parent (parent 14) noted:

“Children spend hours in front of the iPad in an unhealthy sitting position, and I feel guilty about the child's exposure to the radiation emitted from the screen, which might cause poor eyesight and eye sensitivity. This is added to other health problems such as obesity due to the child sitting and eating foods without realising the quantity eaten.”

Another concern about iPad use was access to age-inappropriate materials. This is represented by a parent (parent 12) who noted that:

“Through technological devices and the Internet, a child may be exposed to content inappropriate for his age, as it is an open world that has few limits or conditions. With the age of young children, they do not realise how to distinguish between what is right and wrong, which of course affects their behaviour, especially with ads that appear frequently and contain adult content and are not appropriate for children.”

Another parent (parent 3) voiced concern that:

“The child may acquire violence as a result of watching some films that present scenes of violence in one way or another, or through games that involve wars or

killings. The child is usually affected by what he watches, and even tries to practice it in real life.”

Some parents presented detailed concerns about the consequences of social isolation.

For example, one parent (parent 7) noted that:

“The child gets isolated for hours and lives in his virtual world and loses his social skills, and this will undoubtedly have a big impact in the future.”

Another parent (parent 3) added that:

“These games create a selfish child who loves only himself, and is interested in satisfying his need to play, without looking at or considering others. This is unlike group games like football and other games, in which the child plays with his friend, which develop the cooperative and social aspects of children.”

Parents’ Suggestions Regarding iPad Use by Children with LDs

With regard to suggestions or advice on the use of iPads for children with LDs, Parent 11 offered that:

“iPad devices are in fact not without benefit; if they are used with controls, in a motivational manner, and in reasonable and disciplined times, in this case, they are a positive way to increase accuracy, focus, and follow-up skills.”

Parents provided several suggestions regarding effective use of iPads for learning by children with LDs. With regard to alignment with the curriculum, Parent 2 stated that:

“The app should be aligned with the curriculum so that parents can see how apps relate to the learning objectives for their children and with their children’s learning plan.”

Parent 10 suggested that children:

“must be aware that the devices can cause many problems that appear in the future for the child. So, I advise not to use it for a long time.”

Parent 8 focused on usage age and stated that:

“Young children should not be allowed to use the iPad for more than 2 hours at a sitting, as playing outside should be preferred to using apps.”

Supervision also seemed important, as parent 13 stated:

“Parents have a major role in setting times for use, in addition to benefiting from their use by learning or researching in a controlled manner with programs that ask for parents’ permission.”

Another area of advice was linked to parent’s knowledge of touch screen technology.

Parent 1 stated that:

“In order for parents to supervise their children’s use of the iPad, they need to have some knowledge about it; some parents are not familiar with it or with how they can restrict and prevent their children’s use and determine which apps are appropriate.”

Several parents offered that teacher collaboration with parents is important for facilitating successful iPad educational use. For example, parent 1 stated:

“For the process to bear fruit, teachers must cooperate with parents to choose the appropriate applications... This, of course, points to the importance of teachers knowledge of good and appropriate applications.”

Discussion

According to the results of the present qualitative, exploratory study, iPad use by young children with LDs or educational purposes provokes both positive and negative parental reactions. TSTs (i.e. iPads) have grown in accessibility and availability. Their use is becoming more widespread in the home environment. The current study found that Saudi parents perceive that young children with LDs can learn to use and enjoy this technology. This conclusion is echoed in the results of Couse and Chen (2010), who found that young children can learn to use TSTs quickly and are therefore well positioned to engage in

independent exploration. Furthermore, Beschoner and Hutchison (2013) reported that young children are able to demonstrate independent, successful TST use without the need for assistance. This was also true for young children with LDs in our study.

Many parents in the current study noted—as reflected in the literature (e.g., McCarrick & Li, 2007)—that educational technology use within the home environment facilitates positive learning outcomes for younger learners, including those with LDs. TST learning applications are recognised as able to assist children in learning literacy skills, for example (Dobler, 2012). Previous research corroborates the view that children with various challenges can be assisted by TST use, with such devices able to assist children with LDs acquire basic concepts and to communicate this knowledge (Chmiliar, 2013; Drigas & Kokkalia, 2016). In the present study, Saudi parents of children with LDs reported that their children developed and improved skills across several domains and improved their ability to read and learn using TST applications.

Other improvements parents attributed to TST use included language skills. Some of the parents noted that their children engaged in self-talk when using the applications and imitated the language elements they heard. Several parents also mentioned that their children enjoyed recording and listening to their own voices, and spent long periods doing so. This same finding of improved language skills following TST use was also noted in studies by Chmiliar (2013, 2017) and Murdock, Ganz, and Crittendon (2013), with improvements in play dialogue documented following TST play. Furthermore, improvements in collaboration and communication were documented by Flewitt, Messer, and Kucirkova (2015).

The learning activities and applications available for TST technology could enhance the interest of children during the learning process as a consequence, in part, of multimedia presentation, notably engaging graphics and video (Drigas & Kokkalia, 2016). Many parents in the current study noted that their children displayed longer periods of focus on the

applications and were more likely to successfully complete activities. This was noted even by parents of children diagnosed with attention problems (e.g., ADHD) who typically struggled in the regular classroom setting. One of the key areas in which a number of children demonstrated success during and following iPad use was in creative and imaginative play. A similar finding was reported by Verenikina and Kervin (2011), who recorded children frequently participating in imaginative play when using the iPad.

Some of the areas of parental concern about TST use by young children identified in observational research and in surveys include apprehension about screen time (American Academy of Pediatrics, 2016), potential connections to antisocial behaviour, and challenges linked to a reduction in language ability and attention (Healy, 2004; Christakis & Zimmerman, 2007). Other concerns are linked to online safety—that is, the potential for children to encounter inappropriate content (Livingstone, Marsh, Plowman, Ottovordemgentschenfelde, & Fletcher-Watson, 2014), and whether early childhood development could be negatively affected by overreliance on or overuse of TST technology (Ebbeck, Yim, Chan, & Goh, 2016). Most parents in the current study were concerned that use or overuse of such devices could interfere with intellectual development. Concern about addiction to digital technology was mentioned as a concern by many participating parents, a finding that corroborates previous research on concerns about internet addiction (Nalwa & Anand, 2003). These are challenges that are unlikely be solved by installing “anti-addiction” software (Straker, Pollock, & Maslen, 2009), but instead by empowering parents to teach their children self-regulation and moderation.

Some parents reported detailed concerns associated with TST overuse. For example, parents reported concerns that frequent use of touch screens could entrain unhealthy physical posture. This is a view supported by scholars including Mustafaoğlu, Zirek, Yasacı, and Özdiñçler (2018), who contend that there may be adverse effects linked to the overuse of

TSTs on physical health and growth. Also, according to the American Academy of Pediatrics (2011), overuse of technology can increase risks for child and adolescent obesity. A number of the parents in the current research reported that it was often difficult to manage and monitor the time spent by their children on the iPad. Such findings are similar to the findings reported by Neumann, Merchant, and Burnett (2018) and can be compared with those of Verenikina and Kervin (2011), who found that parents who restricted use of the iPad and limited time to be spent on the device at home had children who were more accepting of these restrictions.

Teacher involvement and support is necessary if TST technology is to be effectively used as a learning aid (McManis & Gunnewig, 2012). In the current study, parents reported that they could benefit from being advised by teachers about which applications are most useful for their children and how these applications relate to the curriculum. This view is supported by Hutchison, Beschoner, and Schmidt-Crawford (2012), who documented that the learning utility of TSTs is linked with the ability of the teacher to relate to parents how TST use is connected to and supports the curriculum. There is a need to ensure that TST applications are directed toward improving curricular integration and providing support in achieving the outlined learning objectives (Northrop & Killeen, 2013). As noted previously, many parents depend on teachers to select appropriate applications for use by their children (Goodwin, 2012).

Parents in the current research highlighted the need for adequate supervision and monitoring when children use TSTs, in the classroom as well as at home. Progress monitoring is highlighted by McManis and Gunnewig (2012) as necessary when collecting data in relation to the ways in which children interact with these devices in service of learning. Digital portfolios and in-built monitoring and recording features in applications are useful for this purpose. From the current findings, although most parents are comfortable

with the use of technology, it cannot be assumed that they have a full understanding of the impact of these products on young children (Ebbeck et al., 2016). Considering the differences in the quality of applications, it is important to note that cost and quality are not strongly correlated (Bouck, Satsangi, & Flanagan, 2016).

Parents who participated in the current study agreed that children cannot be insulated from technology, but also noted that it is important to ensure that technology does not cause harm to the children. Several studies indicate the need for parents and teachers to supervise both access and time spent using technology, especially for young children and children with LDs. According to the American Academy of Pediatrics (2011), the time spent by children using technology (around seven hours per day) is more than in any other activity, apart from sleeping. We note that these are especially relevant concerns and issues in the context of the ongoing COVID-19 pandemic, which has resulted in children spending more time at home and more time online (Adedoyin & Soykan, 2020).

Implications and Conclusions

Parents and early childhood educators have an opportunity to cooperatively embrace a pedagogical approach based on the digital experiences of children to facilitate emergent literacy learning (McPake, Plowman, & Stephen, 2013). With foundations in sociocultural theory (Vygotsky, 1978), the findings of the current study suggest that it is the quality of interaction between the child and the TST rather than the time spent on the TST that is the crucial element to be considered when TSTs are used to support emergent literacy skills. The important role played by parents and teachers (Wood, Bruner, & Ross, 1976) in facilitating early literacy during the use of digital devices by children is highlighted by Bittman, Rutherford, Brown, and Unsworth (2011). Other scholars have also voiced this view (Korat, Shamir, & Arbiv, 2011; Wohlwend, 2010). Even though children tend to be self-motivated to engage with these devices, it has been noted that teachers and parents have an important role

to play in facilitating the use of these tools (O'Mara & Laidlaw, 2011; Stephen, Stevenson, & Adey, 2013).

From the interviews conducted for this study, it can be concluded that participating Saudi parents perceive TSTs as a useful learning tool for children with LDs, if correctly used at school and at home. Parents do not want their children to be left behind when it comes to new technologies. However, they approach the use of TSTs cautiously and with the aim of managing them with care. Parents seek to implement a healthy balance between the use of TSTs and other activities. Parents indicate that they are concerned about overuse and misuse of TSTs at home. There is a need for future studies to address these and other parental concerns to facilitate optimal learning experiences for children with and without LDs in school and at home.

Limitation and Future Research

The current study is a qualitative investigation of a small sample of Saudi parents, and therefore the findings cannot confidently be generalised beyond the current sample. Based on the positive findings from this study related to parental perspectives on use of the iPad as a learning tool for young children with LDs, more academic attention is warranted. Future research might attempt to replicate findings of the current research with a larger sample of Saudi parents, and perhaps by extending data collection to semi-structured interviews with parents, teachers, and the children themselves.

Observation of children using TSTs at home may provide a more ecologically valid assessment of usage behaviours, especially given that previous studies have indicated that the home environment is often more complicated than parent surveys indicate (e.g., McPake, Plowman, & Stephen, 2013). This is a view acknowledged by Gillen et al. (2018), who argue in favour of making digital literacy programs available for families so that they can support children's use of technology. Also, there is a need for longitudinal studies to investigate the

physical, social, and cognitive developmental impact of TST use among children with LDs (Herodotou, 2018). Specifically, the acquisition and development of digital literacy abilities need to be empirically studied considering that some skills are more challenging than others for children to master (Neumann, Finger, & Neumann, 2017; Marsh, 2010).

Moreover, to determine the utility of TSTs and constituent applications for literacy learning, there is a need for methodologically rigorous interventions. Such methods would include randomised design, and pre- and post-testing on a broad array of literacy skills. Given that the literacy environment at home often includes both digital and traditional tools, it may be useful to investigate the impact of using TST applications such as e-books on standard literacy activities and literacy.

Finally, we note that the benefits of digital literacy depend on sustained access to the relevant technology. What is not known is the extent to which children in Saudi Arabia have sustained access to this technology. We therefore recommend that researchers investigate and establish the prevalence of this access. If it is determined that sustained access to digital technology is lacking, this would present an additional challenge that will need to be addressed.

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