

To School Through the Screens: The Use of Screen Devices to Support Young Children's Education and Learning During the COVID-19 Pandemic

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Abstract

The aim of the current study was to investigate how children in Ireland adapted to the change in schooling, and particularly their use of screen devices to support their learning at home, during a period of lockdown due to the COVID-19 crisis in early 2020. This research draws on data from 506 parents of children aged 1-10 years in Ireland who completed an online survey during lockdown in May and June 2020. Parents responded to a series of questions for the Play and Learning in the Early Years (PLEY) Survey about their child's play, learning and development, including questions about their child's education and use of screen devices for educational purposes. The results indicate that screentime increased for most children during lockdown, and they spent significantly more time on schoolwork if they had access to a computer or laptop. They were also more likely to spend time watching educational TV programmes or playing educational screen-based games if their parent believed screen content had educational value. The findings highlight the impact of lockdown on children's lives both for their education, and how they adapted to schooling at home using screen devices. The implications for education and future research are considered.

Keywords: COVID-19; Children; Education; Technology; Screens; Learning

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Introduction

The COVID-19 pandemic has had a huge impact on the world, leading to closures of childcare settings, schools, playgrounds, sports facilities and businesses. UNESCO estimates that 90% of school-age children globally have been impacted by school closures. This raises questions about the scale and extent of the impact of this crisis on many aspects of children's lives, including their education, and how they are adapting to online learning. It should be noted that many schools would have taken a blended learning approach before the pandemic, such as using technology devices in the classroom to enhance the understanding of threshold concepts (Dunn & Sweeney, 2018; Ward et al., 2019), or to scaffold the learning of new concepts, especially in STEM subjects (Falloon, 2013). This is evident from the high rise in Irish educational apps being developed for in-class use (e.g., WordBricks; Ward et al., 2019). However, the reliance on technology during the COVID-19 crisis to facilitate and support learning in young children was unprecedented.

Research released during school closures noted technology and internet use as a beneficial tool in aiding learning at an early age, with studies advocating for the early development of digital skills for later academic achievement (Hurwitz & Schmitt, 2020). However, others have noted the difference between using technology as an additional tool to aid learning, and having it as the only option for learning (Scully et al., 2020). This may pose its own difficulties, the most noteworthy perhaps being the lack of direct teacher-led activities or guidance (Falloon, 2013). Favourably (in light of the transition to online learning), reviews on the subject have found Internet use for learning outside of the classroom to have positive impacts on many areas of academic achievement and social development of the individual (Daoud et al., 2020). However, there is still a debate regarding the types of Internet use that have the best impact on learning, with the differences seeming to lie in whether the content the

child is engaged in during home-schooling is mostly school-mandated, or self-initiated (Naydanova & Doty, 2020).

Much research on this learning approach has addressed limitations and barriers to Internet and device use for learning. These barriers mostly relate to the varying rates of access to these amenities for home learning, whether children live in an urban or rural location, and teachers' technology competence (Marcus-Quinn et al., 2019; Scully et al., 2021). Positively, research on secondary school teaching during the pandemic has noted how this may well result in development programmes for teachers on digital competence (Scully et al., 2021). However, access to such technologies that children have from their homes, and their home location, are less easy issues to combat.

Previous studies show that child ownership and access to digital devices, such as smartphones and tablets, has been rising internationally since 2011 (e.g., Rideout, 2013; Beatty & Egan 2020). Australian children more than doubled their time on digital devices between 2011 and 2015 (Australia, Department of Health and Ageing, 2011; Marsh et al., 2015). Similar trends were also seen in Britain (Lauricella et al., 2015), with 75% of 3-year-olds having daily access to a touchscreen device (Bedford et al., 2017). Most American children were also reported to have used a touchscreen device before 12 months of age (Kabali et al., 2015).

However, according to Devitt et al. (2020), a fifth of Irish children were without access to these devices or stable Internet during the lockdown. Previous research has also shown that children are more likely to have access to, and regular use of, technology devices if their parents also engage in screen use regularly, or believe that screens can be educationally beneficial (e.g., Jago et al., 2014; Lauricella et al., 2015). Cingel and Krcmar (2013) similarly noted parents' attitudes towards screen use to be one of the larger predictors of children's screen time and access to digital devices, when looking at influential factors.

Therefore, the objective of the current study was to investigate how children in Ireland adapted to the change in schooling, and particularly their use of screen devices to support their learning at home during a period of lockdown in early 2020. Given the past research, this study aims to explore whether young children had access to, or used, screen devices for educational purposes; and whether this was impacted by parents' beliefs on the educational value of screens.

Method

Materials. The study used a parental-report survey comprising three of sections, with questions about children's play, learning and development. These included questions relating to children's screen use and education, which are the focus of the current study. Many questions on the survey were drawn directly from the *Growing Up in Ireland Study* (e.g., daily and weekly frequencies of various play activities (McCrorry et al., 2013; Williams et al., 2019) and previous research (e.g., developmental scales; Goodman, 1997). Some questions were also adapted from previous research or developed specifically for the current study (e.g., questions relating to the impact of the COVID-19 restrictions). Demographic information was also collected (e.g., primary caregiver's highest education level and employment status).

The first section of the survey explored the impact of the COVID-19 restrictions on children's play and learning (e.g., amount of time per day spent on screens or doing schoolwork/homework; whether children spent 'more time', 'less time', or the 'same amount of time' on these activities compared to before the restrictions). In this section parents were also asked about their child's access to resources such as the number of books in the home, private outdoor space and various screen devices (i.e., TV, Tablet, Smartphone, Computer/Laptop, Game Console (e.g., Xbox), Handheld Console (e.g., Nintendo DS)). For

the question about screen devices parents were asked to indicate if their child had their own device, or played or used a parent's or sibling's.

The second section of the survey measured aspects of children's cognitive and socio-emotional development using standardised scales. These included the Attentional Focusing subscale from the Children's Behaviour Questionnaire (CBQ) (Rothbart et al., 2001) and the Strengths and Difficulties Questionnaire (SDQ) (Goodman, 1997). The third and final section of the survey asked parents about the physical and social factors that influence their child's play and learning activities (e.g., supports and barriers to play; parents' beliefs about playtime experiences).

For example, in relation to screen use parents were asked to rate their agreement with the following statements on a 5 point Likert scale (1 = strongly disagree, 5 = strongly agree): 'Watching TV supports my child's learning'; 'Playing games on a screen device supports my child's learning'. This section also recorded information about the weekly frequency of various play activities (e.g., playing with blocks or with puzzles), including the use of screens for entertainment and educational purposes, ranging from 'never' to 'everyday'. Details of the measures and data from aspects of the Play and Learning in the Early Years (PLEY) survey not related to screens are not reported here as they are beyond the scope of the current paper.

Procedure. The survey was hosted online using Qualtrics software (Qualtrics, Provo, UT, 2020), and was open to participants for two weeks from May 21st through June 3rd, 2020. At this time in Ireland, schools had been closed since March 13th, with schools not re-opening until early September later that year. Parents were recruited through newspaper advertisements and social media platforms, including via Twitter and Facebook and the survey link was shared on social media with schools, early years settings and parenting networks. Information about the survey, and the link to it, was also available on the Government of Ireland Parent's Centre

(2020) webpage while the survey was open, and it was also shared on social media by the Government of Ireland's Department of Children and Youth Affairs (DCYA).

Participants. The 506 participants in the PLEY Study were recruited using non-probability convenience sampling, and consisted of parents of children aged 1-10 years. The current study focused on school age children and therefore, the final sample for this paper consisted of 366 parents (91.8% mothers, 6.8% fathers, 1.4% other; Mean Age = 41.27 years; $SD = 4.58$) of children aged between 5-10 years (52.7% female, 47.3% male, 87.7% had siblings, Mean age = 7.55 years, $SD = 1.58$). Most parents had a third level/university education (82.9%) and indicated that pre-lockdown they were working (59.7% fulltime; 24.4% part time), with most of the remainder on leave or looking after family (14.4%).

Results

During the lockdown restrictions, 79% of parents reported that their child spent more time on screens compared to before the crisis, while 14% reported it had stayed the same, and 7% reported their child spent less time on screens. The majority of children (80%) spent at least one hour a day on screen devices (see Table 1). Additionally, 68% reported that their child spent less time doing schoolwork/homework, 10% reported the time had stayed the same and 20% reported their child spent more time doing schoolwork/homework, with most children (82%) spending less than two hours on schoolwork daily.

Table 1. Daily time spent on screen time and schoolwork/homework during lockdown between March and May in 2020 (in percent).

	Up to 1 hour	1 to 2 hours	2 to 3 hours	More than 3 hours
Screen Time	20%	45%	18%	17%
Schoolwork/Homework	41%	41%	12%	6%

The most frequently used screen devices by school-age children were a television or a tablet (See Table 2). Parent’s employment status had no impact on children’s use of devices, however parent’s educational attainment did. For example, higher educational attainment by the parents was associated with lower tablet ownership and use by the child, $X^2 = 25.73$, $N = 434$, $p < .001$, Cramer’s $V = .17$, with 45.6% of children with parents educated to certificate/diploma/secondary school level owning a tablet, compared with 17% of children with parents education to postgraduate level. A similar significant association was also found for smartphones, laptop/computers and handheld consoles, all p ’s $< .05$, although child ownership of these devices was lower than for tablets, as Table 2 shows.

Table 2. Percentage of children who play with or use each digital device.

	Uses a Parent's/Sibling's	Child Has Their Own	Child Does Not Use
Television	85%	8%	7%
Tablet	43%	36%	21%
Computer/Laptop	50%	7%	43%
Smartphone	41%	4%	55%
Game Console	16%	13%	71%
Handheld Console	8%	15%	76%

The results indicated that children who had no access to a computer/laptop (either their own or a parent's/sibling's) spent significantly less time on schoolwork on an average weekday during the lockdown than those who had access, $t(358) = 3.35, p < .001$, with similar findings for access to a tablet, $t(360) = 2.03, p = .043$. Access to a TV, smartphone or console did not have a significant impact on the amount of time spent on schoolwork (all p 's $> .05$). The findings also showed that 50% of children used a screen device for schoolwork or homework for more than half of each school week, while 70% watched educational TV, like RTÉ's 'Home School Hub' or TG4's 'Cúla4 ar Scoil', more than once a week. Additionally, 8% of parents listed 'Home School Hub' as one of their child's three favourite programs to watch. However, as Figure 1 shows, watching TV and playing games for entertainment purposes were engaged in more frequently than screen uses for educational purposes.

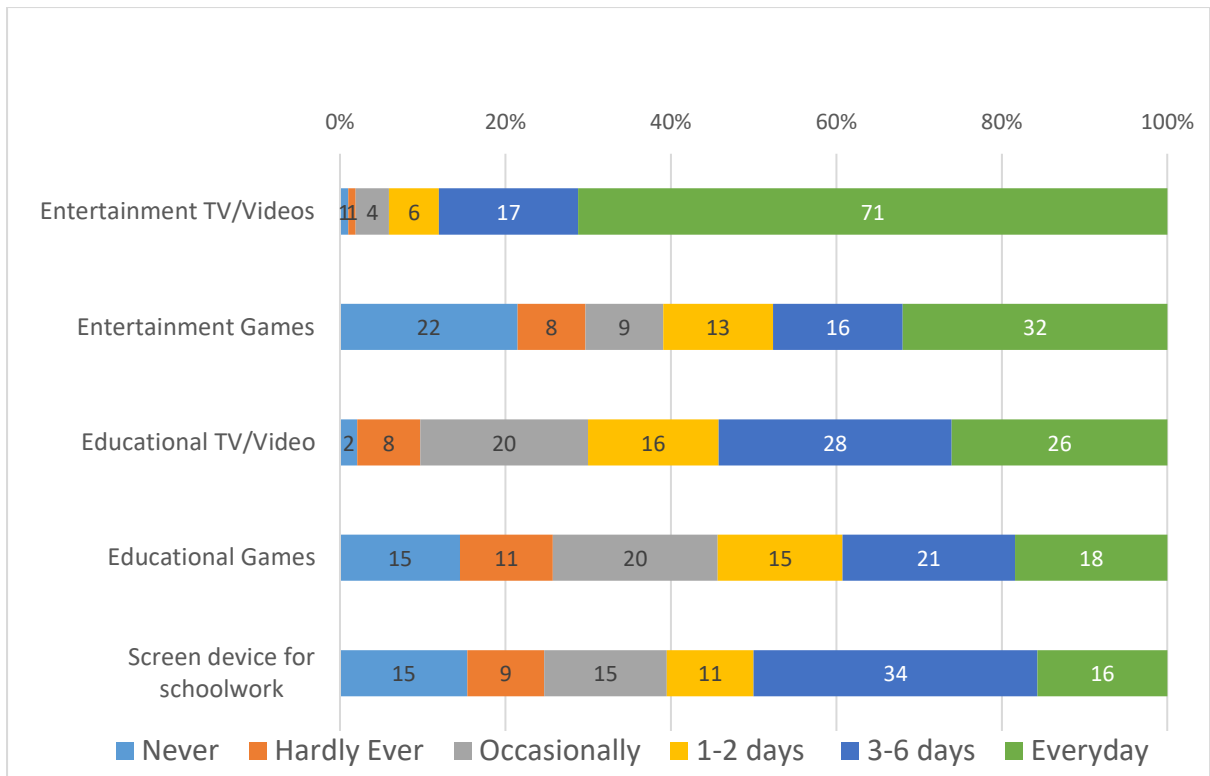


Figure 1. Percentage of children engaged in each screen activity on a weekly basis.

Figure 2 indicates that 85% of parents agreed it was important to continue schoolwork at home, but were divided on whether watching TV or playing games on a screen device supported their child’s learning. Spearman’s rank correlation coefficients indicated that there was a significant positive relationship between parent’s beliefs about screen devices supporting learning and the time their child spent engaged in educational screen use. This was evident for educational games, $r = .273, p < .001$, with a similar positive relationship also found for parents who believed TV can support learning and the daily amount of time their child spent watching educational TV programmes, $r = .146, p = .009$. There was also a strong positive correlation between parents who believed TV can support learning and parents who believed playing games on screen can support learning, $r = .565, p < .001$, suggesting parent’s positive beliefs about the educational value of screens may extend across screen activities. The results also indicated a positive relationship between time spent using a screen device for schoolwork and daily time spent on schoolwork from home, $r = .432, p < .001$.

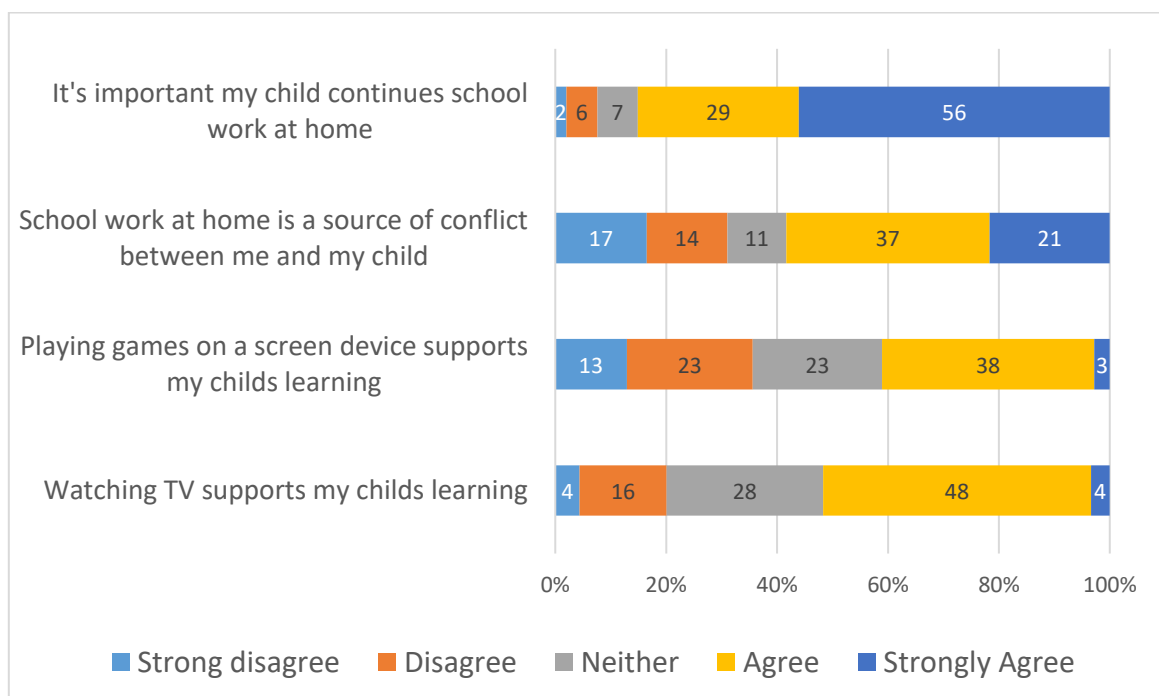


Figure 2. Percentage of parents agreeing or disagreeing with each statement.

Discussion

The findings from the PLEY Survey highlight the impact the lockdown had on children lives in terms of their education, and how they adapted to schooling at home using screen devices. The findings showed that most children engaged in screen use multiple days per week, and on a typical weekday spent at least an hour on screen time. Compared to data collected using the PLEY Survey in 2019, this suggests an increase in daily screen time during lockdown (Egan, Hoyne & Beatty, 2021), although the 2019 data relates to a younger sample than those reported in the current study. However, this is consistent with the finding that 79% of parents in the current sample indicated that their child's screen time had increased compared to before lockdown.

The current findings related to device access are consistent with the findings of a survey conducted by the National Parents Council Primary (NPCP, 2021), which shows that 37% of children have access to their own device for remote learning. This is very similar to the percentage of children in the current study that have their own tablet (36%). However, the findings of the current study showed that even where children may not have their own screen device, they still have access to one, with 93% having access to a family TV, 79% having access to a parent's or sibling's tablet, and 57% having access to a computer or laptop.

The findings of the current study demonstrate that access to screen devices is important for supporting school work during lockdown, with children spending more time on school work if they have use a laptop or computer. This echoes the findings of Devitt et al. (2020), where tablets and laptops were found to be the most used devices by Irish primary school children for learning during the lockdown. However, a lack of access to a screen device may not be the only screen-related barrier to remote schoolwork. The NCPC found that 37% have unreliable

broadband, 46% have limited or no access to a quiet space, and 55% are unable to access remote learning without adult supervision.

Another potential barrier to the use of screen devices for educational purposes during lockdown relates to parent's beliefs about the educational value of TV or screen games. The findings indicated that 20% of parents disagreed that watching TV supports their child's learning, while 36% disagreed with a similar statement on playing games on a screen device. Furthermore, the findings showed that parent's beliefs were significantly correlated with the amount of time their child spent playing educational screen games or watching educational TV. This is consistent with research by Lauricella et al. (2015), where parent's attitudes towards digital devices significantly impacted on their children's amount of screen time. This was especially true for children under the age of 8 years, as parental rules likely influenced their access to, and time spent on, devices in the home.

However, the cause-and-effect nature of this relationship is not clear. One possibility is that parent's positive beliefs about the educational value of screen activities led these parents to encourage more educational uses of screen devices. Another possibility is that parent's positive beliefs about the educational value of screen activities was driven by the availability of educational screen content, such as games recommended by the child's teacher or by programmes such as Home School Hub. Future research should investigate this further.

The findings of the current study have practical implications for future lockdowns, both in Ireland and internationally, and for the integration of screen devices into the educational curriculum during the school day, and for homework. The findings highlight the importance of device access, although this challenge to learning can be addressed through government grants such as the Digital Strategy for Schools (Department of Education, 2020), which provide schools with funding to better-equip staff and students for future blended or online learning.

While this may help with problems of access, more support may be needed in relation to parents who do not believe screen use can support their child's learning. It may be that a national information campaign about the potential educational value of screen use, and the variety of educational activities and content available to support learning in young children, would be beneficial.

Conclusion

The findings from the PLEY Survey provide insight into how young children in Ireland adapted to schooling at home using screen devices during the first COVID-19 lockdown in 2020. The results indicate that some children and families had access to multiple screen devices to support learning, while other families were less inclined to use screen devices for educational purposes. The factors that support or hinder schooling through screens are varied, as the study showed, and include both the resources available in the home, and parental beliefs about the value of screen devices for educational purposes. Further research is needed to assess the availability of educational screen content, such as the roll out of RTÉ's Home School Hub during the lockdown, and whether this could change parent's beliefs on the educational value of screen content. The responsive and nurturing educational support provided by teachers and school staff during remote learning periods, and facilitated by parents and digital devices, was essential in helping young children through this challenging period.

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