Parent Perceptions of Technology Use in K-12 Classrooms

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Parents are important stakeholders in the educational experiences of their children. Their views about technology shape the perceptions students have about technology. These conceptions also shape how they view what should be happening in the K-12 classroom. Our study an open-ended question survey to explore how parents view technology use in classrooms and how they manage technology in their own homes. Finally, we discuss the implications of this research for teachers, administrators, and future researchers.

Introduction

In the field of educating children there is simply no greater role than that of the parent. Research suggests that children learn lifelong characteristics from their parents (Ceka & Murati, 2016). While this can include preferences and personality traits, it can also influence student perceptions of the value of classroom activities (Scully et al., 2014). For example, adult perceptions of internet-related tools in the workplace have been shown to influence their decisions to adopt those tools for everyday use (Chen & Tu, 2018). Subsequently, if a parent thinks that a certain tool has favorable outcomes, then they will inspire their child to believe the same (Ortiz et al., 2011). Parents can be effective partners and supporters of classroom activities and student learning, but this often requires clear communication and an understanding of what they believe.

Literature Review

Technology is becoming increasingly more ubiquitous in both our lives and education. Education Week reported that in a COSN study 40% of schools offered one device per child, and 43% did not, but expected to reach that goal in the next 3 years (Cavanagh, 2018). Research suggests that this rise in technology use may affect student achievement (Korucu & Cakir, 2018; Delen & Bulut, 2011; Lawrenz et al., 2006). In 2018, Project Tomorrow reported that 83% of parents reported believing that the effective use of technology in their child's school is important (Evans, 2018). With the rise of 1:1 (one device per child) and 1:2 (one device per 2 children) computing initiatives, students have more access to technology than ever before (Richardson et al., 2013). Even while these programs continue to expand, few studies conclude that parents believe

technology literacy relates to academic success and future career success (Ortiz et al., 2011). There are even fewer studies that take the perceptions of parents into account (Jin & Schmidt-Crawford, 2017). These daunting realities coupled with the fact that parental support and confidence is important for promoting students' use of these educational technologies suggest that educators need to better understand what parents think about classroom technology to engage them as partners (Lin et al., 2012; Dunlap & Alva, 1999). Research indicates that parental support toward educational tools and processes can play a role in their child's dispositions regarding these technologies as well (del Carmen Ramírez-Rueda, 2021). This can be an important factor to consider, especially when parents do not always have the same educational experiences using technology (Keane & Keane, 2018).

One of the issues coming to the forefront is digital equity and the disparities of access to technology, especially for students from lower socioeconomic communities and communities of color (Kim et. al, 2011). Given that parents in these groups may be less prepared to support students using technology and may have less time to interact with classroom technology projects could show that these parents may need training themselves to engage with the technology that their students are using in the classroom as suggested by Robinson (2010).

We sought to answer: How do parents feel about using technology tools for learning and education? How do parents manage technology in their own homes? What do they expect from schools?

Methods

We adapted the survey designed by Baş et. al (2016) called the Perceptions Towards Technology in Teaching and Learning Process Scale. This particular survey was designed to measure teacher perceptions of information communication technologies (ICT – the term for educational technology used in other parts of the world). For this instrument the designers defined ICT as technology such as computers, tablets, and more digital devices. The survey consists of 25 items on a Likert scale that address attitude, usage, and belief. We adapted the questions to make them applicable to parents instead of teachers like the original surveyors. The adapted questions were kept in the same order and followed the same design of the original survey. Examples questions included, "The use of technology makes the teaching and learning process more interesting" and "Teachers should reinforce students to use technology in the teaching and learning process." Each question was answered on a five-point Likert scale.

We organized our instrument to include demographic information at the beginning and a number of open-ended questions throughout to gain a deeper understanding of parents' opinions and beliefs regarding technology. The open-ended questions asked about parental limits placed on technology use at home, monitoring strategies for technology use, concerns about technology use at home and at school, and considerations for educators on student technology use.

To recruit participants, we posted the survey to our social media pages (Facebook and Twitter) and the survey was sent to our professional email networks. This survey and recruitment plan were approved by the Institutional Review Board. As we analyzed our results, we discovered that the demographics suggested that this sampling method did not produce a diverse response. We will discuss this issue in more detail in our limitations section. Once data had been collected, we analyzed and coded the survey results to summarize our findings and look

for trends. For the open-ended questions, we read all responses and organized them into themes. Two researchers coded the responses independently. We then consulted an expert in the field of educational technology to check our categories and our analysis to ensure validity (Johnson, 1997). These methods were used to ensure that bias was minimized, and findings would be reliable, valid, and have a degree of applicability to diverse educational settings.

Results

Demographics

Our 101 participants were between the ages of 35-44 and Caucasian. 49.5% of participants reported a household income of $100,000 or more, and 45.54% participants had a bachelor's degree as their highest level of education. 44.5% of the parents who completed our survey, had two children and 27% had three, and the majority of them were in elementary grade levels. We also determined that 75.24% of respondents sent their child(ren) to a neighborhood public school.

Survey

For the survey results, we analyzed the mean, median, mode, and standard deviation of all 25 five-point Likert survey questions. For all but two of the questions, the mode was 4 allowing us to infer that a majority of respondents agreed with the questions. The means of these questions ranged from 3.42 to 4.06 supported our inference. The standard deviation values ranged from .732 to 1.50 indicating that the majority of respondents answered similarly. Two questions had modes of less than 4. Question 11 stated, "The use of technology in the teaching and learning process saves energy." The mode for this question was 3 and the mean was 3.08. Question 14 stated, "Teachers should give priority to technology more than textbooks in the teaching and learning process." The mode for this question was 2, and the mean was 2.70.

Open Ended Questions. For the five open ended questions we created, for each a table identifying the theme, description of the theme, and an example from the data set to explain our findings (Tables 1-5).

Table 1

What limits (if any) do you place on technology at home?

Theme	Description	Example
Time Restrictions	Setting a time limit on technology use or enforcing a curfew.	"Certain hours only i.e. between 2-4 p.m. No screens within an hour of bedtime. No screens in their bedrooms. No screens at mealtime. No Fortnite."
Parental Oversight	Parent must be present during the use of technology.	"Not allowed to use devices without adult present to monitor content. Only allow 30 mins play time per sitting, which usually he only plays on it 3-4 times per week."

Trade Offs	Child must do something in order to use technology.	" For every 30 minutes of screen time you must either read for 30 minutes, do a chore, or play outside for 30 minutes."
Age Restrictions	Limit or restrict use dependent on age.	"For pre-k only use 20 mins at a time. For my 3rd grade student they can only use the iPad for 60 mins at a time."
Trust	No limits	"Not much, we trust them"
Content Restrictions	Restrict what children are allowed to use on technology.	"Time and content; less than an hour; no YouTube; typically limited to educational apps or Minecraft."
Content Blocking Software	Use some type of app or software to block and limit usage.	"Website Guard; limit of screen time for gaming"

Table 2

How do you monitor your student's technology use?

Theme	Description	Example
Direct Permission	Parents must verbally confirm or enter a password.	"We use tech only in the main areas of our house, only with direct permission (password protected), and with filtering/reporting software (covenant eyes)."
Direct Parental Supervision	Parents must be present during use.	"They are only allowed to use it in my presence."
Indirect Parental Supervision	Parents use blocking or monitoring software or check history.	"Through the device and through use of a Circle device connected to our internet."
Trust	Parents do not monitor use.	"Don't. Education and trust."

Table 3

What concerns do you have about your student(s)' technology use at home?

Theme	Description	Example
Loss of Other Skills	Effect on communication skills, cognitive skills, play time, etc.	"Losing brain cells, missing out on other important development when using screens - interacting with others, asking questions, face to face communication, talking, emotional intelligence, and play."
Access to Inappropriate Content	Accessing inappropriate content such as adult websites or violent games	"I am concerned that access to bad sites is too easy to get."

Distraction	Technology as a distraction from other tasks.	"My only concern is that they can be distracted with one click of a button into other things instead of the task at hand"
Overuse of Tech	Excessive exposure to screen time or excessive time spent on tech	"being on electronics for way to long"
None	No concerns	"none"

Table 4

What concerns do you have about your student(s)' technology use at school?

Theme	**Description**	**Example**
Lack of Monitoring	Concerns about monitoring content students are accessing, either by the teacher or content filtering systems	"Is it really being monitored and used correctly? Things are filtered but kids have accessed sites that aren't allowed."
Technology Integration	Using technology for educational gains rather than as a play tool or time waster	"Making sure it isn't just play time" "Are they being taught or just being given a website. There still needs to be class discussion and direction from the teacher"
Lack of Social Interaction	Students engaging less in peer interaction in favor of using technology	"Lack of communication with peers, not learning how to have face to face conversations, too much time on devices, not enough time spent in reality"
Information Retention	Retaining information taught using technology	"They don't retain information as well from screens."
Age Appropriateness	Age/grade of children that should be using certain technology	"I think that in the younger grades students should still spend less time using technology and more time actually writing, coloring and reading. Young kids grown up with screens in their hands and they need to develop their fine motor skills. I absolutely see it as a benefit in older grades."
Lack of Consistency in Adoption	Inconsistencies in how teachers use the technology	"Lack of consistent adoption by all teachers."
Technology as a Distraction	Distracts students from school related tasks	"They have a hard time staying focused on schoolwork when they can click over to YouTube and other distracting websites"

Table 5

From a parent perspective, what would you like educators to think about regarding student use of technology?

Theme	Description	Example
Balance	Balance time spent on technology with other means of teaching	"Balance the use (because it's unavoidable and necessary in today's world) with people and social skills that are also vital to development at their ages."
Effective Use	Using technology for educational purposes rather than as a time waster	"I would like educators to allow technology to create connections, to break own classroom walls, to allow for collaboration and to allow for students to create."
Increased Direct Monitoring	Teachers directly monitoring student use	"Make sure they are only on appropriate websites."
Increased Indirect Monitoring	Safeguards in place for content filtering and blocking inappropriate material	"Ways to safeguard the technology. The students need to be blocked from external sites, so they stay on task while working and aren't cheating (can you tell I'm also a HS teacher?)."
Screen Time Considerations	Monitoring the amount of time students spend using screens	"Too much screen time is bad"

Discussion

From the Likert items we found that parents were in support of using technology in schools. Only two items were not overall positive. Question 11 about energy for technology integration was awkwardly worded and may have confused respondents. From the Likert items we found that parents were in support of using technology in schoo-ls. Only two items were not overall positive. Question 11 about energy for technology integration was awkwardly worded and may have confused respondents. Question 14 which stated that, "Teachers should give priority to technology more than textbooks in the teaching and learning process" produced the strongest response from parents. We had hoped that parents might have viewed electronic textbooks as a technology that prepared students for future work. In future surveys, we plan to ask more questions about parental views on eTextbooks. The current body of literature indicates that many researchers have discovered that parents had strong views about electronic textbooks. Parsons and Adhikar's (2016) findings reported that parents preferred textbooks for their students for many reasons such as information retention, reading comprehension, and penmanship. Additionally, if they, as parents, do not have the computer literacy needed to assist their students in this digital learning experience, then they would not feel like they could assist their students in using digital texts (Parsons & Adhikar, 2016). Parents' report having positive memories reading printed books, and electronic textbooks do not match their own reading experiences (Zickuhr, 2013). These experiences are paramount to the insights that parents have formed regarding technology.

An overwhelming seventy-eight percent of our sample identified as white upper middle class. The remaining respondents consisted of 9% African American or Black, 7% Native American or Indigenous, 5% Hispanic, and 1% Asian. In hindsight, we wish we had asked about occupation, because given our recruitment strategy of using our social networks, seeing this result, we fear that many of the respondents were teachers. The Office of Planning, Evaluation, and Policy Development (2016) reports that 82% of all United States teachers identified as Caucasian or White and 7% African American or Black, 8% Hispanic, 2% Asian, and less than 1% Native American or Indigenous. The demographic information that we collected are similar to the demographic make-up of the United States educator workforce and the aforementioned figures validate our concern.

While the survey items showed that parents had an overall expectation that technology would be used in their students' schools, the open-ended questions gave deeper insight into their concerns. Their responses showed engaged parents who blocked inappropriate sites, watched their child's internet use, and limited the amount of time that their child spent online. Knowing this, parents may be interested in knowing how schools are limiting content and may possess some technical knowledge from their management at home to better understand how technology is managed at school. To better understand their monitoring behavior, we asked parents specifically what they did—some required that their child ask permission before using technology, others supervised directly or through software like Circle. A final group of parents relied on trust. Knowing that parents showed a variety of supervision behaviors shows their expectation that their child's technology use would be supervised. This may be related to our sample as well, since we have a highly college educated group of parents, and the Pew Research Center found that parents with more education, had greater concern about

child technology use and also showed more supervision (Auxier et al., 2020).

Our next questions asked parents to share their technology concerns at home and at school. We noted that parents' concerns were similar in both environments. They were concerned that technology would distract students or that students would be able to access inappropriate content. They saw that students could easily get distracted at home and questioned if their student could also jump over to YouTube or follow an ad at school. When reflecting on adult use of technology, this is a current concern during technology-use. This correlated with what they reported as their behaviors with student technology use at home, thus showing that they expected similar supervision at schools. At school, they had additional concerns about technology being used to fill time and taking away from other educational goals like information retention and developing social relationships, one parent specified that (s)he was concerned that that they may not be "learning how to have face to face conversations." In the final question, they offered advice to educators about technology use in the classroom. For the parents that completed our survey, they wanted their students' technology use to be monitored both directly and indirectly in the classroom. They had an expectation that while at school their students would be protected from inappropriate sites and only using technology for educational purposes. From these responses, it may not have been clear to them that this is a provision of the CIPA (Child Internet Protection Act) passed in 2000 and integrated into the E-Rate program that offers advantaged pricing for school technologies (CIPA, 2020). In some districts, there is specialized software that is installed on each device that can both monitor and filter content. Other districts control access to sites using internet routers likes Cisco's Meraki which filters student access before the information even gets to the device. They also wanted teachers to balance the use of technology with other types of activities and be cognizant of the amount of time students spent on the screen.

While the parental concerns were valid, they also showed something else. Most of the parents that responded to this survey were not aware of the technology practices that were happening in their child's school. They were not aware of the filtering approach the school took or the efforts that were made to protect students from inappropriate content while in the classroom. Additionally, parents were interested that technology use was balanced with traditional activities, and they were concerned about screen time. It leaves us to ask the question, what kind of communication are these parents getting from the classroom teachers and the school leadership? Are parents being trained in the technology that their student is using? Are they made aware of the school policies regarding technology use? How is the classroom teacher sharing with parents the projects that students are creating using technology?

Implications

Much can be learned and applied by teachers, researchers, and principals. Parents feel as though there should be a balance between the use of technology and physical hands-on classroom work. Many believe that teachers are using technology as a substitute for best practices in the classroom. Parents fear that this increased technological integration will result in their students have less refined social skills and lower information retention than previous students as a result. With technology integration beginning earlier and earlier for most districts, many fear that young children are being exposed to technology too early. Parents have expressed valid concerns about

screen time and monitoring of student technology use (Auxier et al, 2020). This makes it important for teachers and administrators to be transparent about how they are using technology in the classroom. This can be done in several ways. Weekly newsletters can highlight student use of technology stressing creativity and content creation over electronic worksheets. This could also include creating projects where families contribute to the technology rich lessons so that the classroom activities are demystified. Successful 1:1 programs work to make parents partners in these educational experiences. Many require parents attend workshops and orientation in order to provide them with information on how they should be used (Donovan et. al, 2010). Finally, the IT department and leadership should clearly communicate to the community what they are doing to protect students while online. E-Rate requires that districts have a filtering plan, but this is often not communicated well outside of the school building (CIPA, 2020).

Specific Implications for Teachers

As a result of these findings, teachers should attempt to integrate technology with traditional means of teaching. This will ensure that students learn hands on skills that are necessary for cognitive development while learning the technology skills that are a new form of literacy for 21st century learners (Stone, 2017). Additionally, this balance will give students opportunities to develop or improve social skills. Technology integration should also take into account students' age and cognitive development. This will ensure that students have the opportunity to develop in a way that is appropriate for their development stage. Since increased integration leads to increased screen time, teachers should be mindful of the amount of time that their assignments require students to be "plugged in". Additional direct and indirect monitoring would ensure that students remain on task and working efficiently. This increased monitoring would assist teachers in keeping students engaged while decreasing student screen time by maximizing the time spent on devices.

Implications for Teacher Candidates & Teacher Preparation Programs

Teacher preparation programs can benefit from this study in several ways. First, accreditation practices with organizations like CAEP (Council for the Accreditation of Educator Preparation) are calling for teacher education programs to better prepare teachers to use technology throughout the curriculum (CAEP, 2020). Most teacher education programs have coursework on communicating with parents and other stakeholders. It is important for future teachers to be aware of parental views about technology use, how to communicate with parents, and keep that in mind as they design lessons. Teacher preparation programs should be cognizant of this and integrate strategies that will ensure that new teachers are confident connecting with students' families as a way of ensuring their success. The recent pandemic has made this need even greater, as teachers have had to partner with parents to achieve learning outcomes using technology (Garbe, Ogurlu, Logan, & Cook, 2020). Moving forward, teacher education programs need to ensure that they produce teachers who have even greater understanding of the role of parents on student technology use and supply them with tools that can help leverage these relationships for student achievement.

Implications for Principals

As instructional leaders, effective and appropriate use of technology should be an insistence. Leaders, through their evaluations

of teaching and the Professional Learning Network (PLN) should train faculty and give feedback that will ensure that technology is being used in a meaningful way in the classroom and not as a substitute for paper and pencil assignments. Additionally, principals and instructional leaders should lobby upper administration for increased indirect monitoring tools like LanSchool Air, JAMF, and Cisco Meraki where student devices can be monitored actively or passively, not just for parental peace of mind, but also to keep technological distractions limited. This will ensure that parents and teachers can allow students to work safely without access to unauthorized sites.

Implications for Future Researchers

Our research findings were meant to be a foundation for additional research to build on. With this in mind, future research is still needed. There is some information on what parent perceptions are, however, more research is needed on how they form and change over time. These questions could be answered by a longitudinal study that followed parents from the birth of their child to college and questioned them about their perceptions on technology, when they changed, what caused them to change, and the effect this has had on them and their children. Future research could also focus on the perceptions of grandparents and how those change as a result of the interactions with their grandchildren. This research would add a plethora of information to the existing body of knowledge on parental perceptions of educational technologies.

Limitations

To improve our research in the future, we suggest a few changes. In our survey, we neglected to ask the industry in which parents worked. While this question may seem anecdotal, we realize that parents working in technology and educational fields may have different experiences that may have skewed our results. As mentioned previously, we used our social networks to recruit, and since all authors are educators, we may have over sampled from teacher communities. In addition, since a lack of access to technology exists for lower socioeconomic families, those families may have different experiences with technology. Just by using a digital survey shared via social media indicates that the parents who completed this survey were already technology-using adults. Although it was previously mentioned, another salient limitation would be the sample size. With a study of such a small size, we are cognizant that the results of this study might not be as generalizable as they would if the sample size were larger. Finally, this research was conducted prior to the COVID-19 pandemic. With the necessary switch to distance learning in many school districts, parent opinions may have changed since our research was completed.

Conclusion

Parents play an important role in the education of their children; that is undeniable. Also, as constituents, their partnership is important for bond issues and other funding processes that support school innovation. While this research was completed pre-COVID, it cannot go without saying that the pandemic and subsequent move to virtual learning has highlighted the importance of parental education, technology views, and parents' role as educational partners. Only through clear communication, can parents become the partners that educators need to provide the best education for each child. Our hope is that this research will inform further research into this topic and also inform educators about the views that parents may hold concerning technology. By beginning this conversation about parental perceptions about technology use in

education, we expect that later research will examine the effect of these perceptions on student learning and student perceptions of technology in education.

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