2020

It's fun!" Using students' voices to understand the impact of school digital technology integration on their well-being

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Recommended Citation

Mourlam, D. J., DeCino, D., Newland, L. A., & Strouse, G. A. (2020). "It's fun!" Using students' voices to understand the impact of school digital technology on their well-being. Computers & Education, 159, Article 104003. https://doi.org/10.1016/j.compedu.2020.104003

This is the accepted version of the following article:

Mourlam, D. J., DeCino, D., Newland, L. A., & Strouse, G. A. (2020). "It's fun!" Using students' voices to understand the impact of school digital technology on their well-being. *Computers & Education, 159,* Article 104003. https://doi.org/10.1016/j.compedu.2020.104003

"It's fun!" Using students' voices to understand the impact of school digital technology integration on their well-being

Abstract

The purpose of this phenomenological study was to better understand children's perception of their school-based educational technology use and its role in their well-being. Children (N = 23) from the Midwestern U.S. completed an interview and mapping exercise focused on the contexts and factors that impact their well-being, including schools and teachers. Phenomenological analyses of interview transcripts focused on children's perceptions of 1) school educational technology use, and 2) the impact of school educational technology use on their well-being. Children described a variety of school educational technology experiences, which they perceived as having both positive and negative effects on their well-being. Findings are discussed in the context of the historical challenges to school educational technology integration and children's well-being.

Keywords: Media in education; elementary education; improving classroom teaching; qualitative research; children's well-being

1. Introduction

Children attending school in the U.S. today were born into a world with near ubiquitous access to digital technology and media. Simply put, through technologies today's youth now have greater access to information, people, and ideas than at any time in the past (Fitton, Ahmedani, Harold, & Shifflet, 2013; Kaye, 2017; Pea et al., 2012). By the time they enter school, most children have had several personally meaningful interactions with technologies and have acquired the skills needed to use popular tools such as touchscreen tablets (Hsin, Li, & Tsai, 2014; Kaye, 2017; Citation 1 removed for review, 2019; Zevenbergen & Logan, 2008). As a result, educators are expected to take full advantage of educational technologies, integrating these digital tools into children's learning experiences in developmentally appropriate ways (US Department of Education, 2017). Many schools have embraced digital tools, resulting in a growth of technology-rich experiences for children (Berrett, Murphy, & Sullivan, 2012; Inan & Lowther, 2010). However, effective use of these tools to support students has often been unsuccessful (Cuban, 2002; Phillips, 2015; Selwyn, 2011), occurring at a time when school investment in educational technology has increased steadily (Koba, 2015; McCandless, 2015) .

Although educational technologies have been considered common in most schools for quite some time (Becker, Ravitz, & Wong, 1999), the majority of technology integration into learning remains limited (Delgado, Wardlow, McKnight, & O'Malley, 2015; Spector, 2001). Gray, Thomas, and Lewis (2010) found that teachers primarily used technologies for administrative purposes, while students used computers in school much less often. A potential explanation for the lack of effective technology integration

may be that teachers have not taken advantage of pedagogy grounded in (a) the learning sciences and how people learn, and (b) 21st century competencies needed for future success in today's society (Fishman & Dede, 2016; Fishman, Marz, Blumenfeld, Krajcik, & Soloway, 2004; Jonassen, 1995). This may be due to the relationship between teacher's pedagogical beliefs and their technology use, where teacher beliefs influence how much and in what ways educational technologies are used during instruction (Ertmer, Ottenbreit-Leftwich, Sadik, Sendurur, & Sendurur, 2012; Hew & Brush, 2007; Tondeur, van Braak, Ertmer, & Ottenbreit-Leftwich, 2017).

Given the historical and persistent difficulties schools have faced related to technology integration (Cuban, 1986; Cuban, 2002; Kirkwood & Price, 2013; Reeves & Reeves, 2015; Spector & Anderson, 2000), we problematize this issue by asking, what does technology integration look like in school today and what impact has it had on children and their well-being? In doing so, rather than investigating teachers' perspectives and technology integration directly, we have instead leveraged children's lived experiences as a participant, member, and learner in the classroom to better understand this issue. It is important to consider the perspectives of children (Goodlad, 2004) and although research on children's well-being has increased in recent years (Dinisman, Fernandes, & Main, 2015), much of the research is from the perspective of adults (Poulou, 2017) or children's responses to close-ended surveys (e.g. Wentzel, 1998). Children should have a right to be heard and are their own experts when it comes to describing their experiences and the impact of those experiences on their well-being (Dinisman et al., 2015; Fattore, Fegter, & Hunner-Kreisel, 2018; Citation 5 removed for review, 2018; Simmons, Graham, & Thomas, 2015).

1.1. Technology & Children's Well-Being

Digital technologies and media are viewed by children in the U.S. and other countries as a central part of their identity, likely due to the availability of technologies in their lives since early childhood (Brown & Bobkowski, 2011; Fitton et al., 2013; Hsin et al., 2014; Michikyan, Dennis, & Subrahmanyam, 2014; Ofcom, 2015). The time individuals spend using digital technology and media appears to increase with age, with young children spending approximately two hours daily, adolescents between four and seven hours, and parents spending approximately nine hours a day using screen media (Common Sense Media, 2013, 2016; Fitton et al., 2013; Jensen, George, Russell, & Odgers, 2019; Pea et al., 2012).

As a result of children's increased daily use of digital technologies and media, multiple organizations, such as the American Academy of Pediatrics (AAP; 2016) and National Association for the Education of Young Children (NAEYC; 2012), have expressed concerns regarding their impact on children's well-being. An important indicator of children's overall health and happiness (Casas et al., 2012; Children's Worlds, 2011; Kamerma et al., 2009; Lawler et al., 2017), subjective well-being consists of many factors categorized as either hedonic (i.e., life satisfaction, positive affect) or eudaimonic (i.e., potential in life, positive relationships, autonomy; Antaramian et al., 2008; Casas et al., 2012; Deci & Ryan, 2008; Dinisman et al., 2012; Ryan & Deci, 2008; Ryff & Singer, 2008; Singh & Lal, 2012). The AAP and NAEYC have published recommendations that children's daily technology use be limited in amount and restricted to developmentally appropriate content and contexts (AAP, 2016; NAEYC, 2012). However, there is currently disagreement within the field regarding the impact of digital technology and media on children's well-being, with some researchers expressing significant concern and others emphasizing potential benefits.

1.1.1. A negative contributor to children's well-being

Concerns surrounding children's well-being and digital technology and media often stem from what is being replaced as a result of increased use. That is, as play, family time, and in-person interactions are reduced in children's lives due to digital technology and media use, there is the potential for negative consequences on children's emotional, physical, and social well-being (Brown & Bobkowski, 2011; Common Sense Media, 2016; Egan & Moreno, 2011; Gross, Juvonen, & Gable, 2002; Harman, Hansen, Cochran, & Lindsey, 2005; Kross et al., 2013; Pea et al., 2012; Rideout, 2013; Savahl, September, Odendaal, & Moos, 2008). For example, researchers have found some children use social media as a coping mechanism for social anxiety and loneliness and are often exposed to negative content (e.g. body-image distortion, interactions with strangers, etc.) that can negatively shape behaviors and attitudes (Brown & Bobkowski, 2011; Levine & Harrison, 2009; Sargent et al., 2006; Ward & Friedman, 2006). In addition, Smahel, Wright, and Cernikova (2015) found that children described the negative issues related to cognitive salience, aggressive behaviors, and sleeping problems as a result of their digital technology and media use.

Another concern with increased digital technology and media use is the negative impact on children's physical health. A primary concern is the reduction of children's physical activity when combined with food and beverage advertisements commonly found in the media, could result in increased occurrences of childhood obesity (Chau, 2014; NAEYC, 2012; Papdakis, Kalogiannakis, & Zaranis, 2018). Smahel et al. (2015) found children reported eye problems, headaches, eating problems, and tiredness, sometimes after only 30 minutes of digital technology and media use.

The extent to which children experience the negative impacts of digital technology and media use may partially depend on children's differing content and contexts of use. For example, teens from low SES households have been found to spend

more time watching videos than their high SES peers (Rideout, 2015) and be less likely to experience active parental oversight of their technology use (Mascheroni & Ólafsson, 2014). Perhaps partially because of these differences in usage, some negative outcomes also differ based on family income level. For example, children from low income families were more likely to get into face-to-face fights and confrontations as a result of their social media use (Odgers, 2018). George and Odgers (2015) also found that children struggling and vulnerable in non-technology contexts were more likely to experience negative interactions through digital technology and media, such as negative interactions with others online, and increased passive, rather than active, engagement online with others. Odgers (2018) explained, "What we're seeing now might be the emergence of a new kind of digital divide, in which differences in online experiences are amplifying risks among already-vulnerable adolescents" (p. 433).

If children experience and are impacted by digital technology and media in differing ways, it would explain some reports in the literature where researchers have failed to find any links between technology usage and specific impacts on children's well-being. For example, Jelenchick, Eickhoff, and Moreno (2013) found no link between social network use and depression among older adolescents. Jensen et al. (2019) concluded in their study that there was no evidence of "longitudinal or daily associations between technology and mental-health symptoms" and that digital technology and media use was not predictive of future mental-health symptoms (p. 14). Some researchers have argued that, although digital technology and media may have a negative impact on children's and adolescents' well-being, that it may be best to view the magnitude of that impact by comparing it to other factors (Orben & Przybylski, 2019). In their analysis of three large-scale data sets, although there was a small negative association between technology use and adolescent well-being, other factors,

such as bullying, had larger negative associations. In a large study of UK adolescents, Przybylski and Weinstein (2017) found that there was no association between mental health and moderate technology use with only small negative associations with high technology use. Orben and Przybylski (2019) argued that comparing the size of the association to neutral factors, like eating potatoes, which has nearly the same negative association with well-being as digital technology and medai, is the best way to judge its impact.

1.1.2. A positive contributor to children's well-being

Although increased digital technology and media use by children raises several legitimate concerns that parents and educators need to be cognizant of, there are also several potential positive ways these tools can impact children and their well-being. Sweetser (2012) characterizes active technology use as those experiences with digital technology and media where individuals are cognitively or physically engaged. Through digital technologies and media, children and adolescents have greater access to individuals than in the past, which has created opportunities for them to express their identities and strengthen connections with friends and family members (Brown & Bobkowski, 2011; Livingstone, Blum-Ross, Pavlick, & Ólafsson, 2018; Citation 2 removed for review, 2018). Brown and Bobkowski (2011) explained that children and adolescents are no longer "a passive audience" (p. 96) and are strongly networked with peers and those with similar interests. Digital technologies and media also afford children the ability to stay connected with family and friends physically separated either by space or time (Common Sense Media, 2013; Fitton et al., 2013; Manches, Duncan, Plowman, & Sabeti, 2015).

Digital technology and media use can also have a positive impact on children's learning through educational TV programming, games, ebooks, and other

developmentally appropriate uses in formal education settings (Chang, 2008; Common Sense Media, 2013; Hsin et al., 2014). Researchers have shown active technology use can lead to academic success, ranging from content knowledge development to new skill development characterized as 21st century skills (Aladé, Lauricella, Beaudoin-Ryan, & Wartella, 2016; Huber et al., 2016; Kwok et al., 2016; Tarasuik, Kaufman, & Demaria, 2017; Schroeder & Kirkorian, 2016). Perhaps most important in fostering positive technology-rich learning experiences for children is creating developmentally appropriate contexts within which children can be engaged physically and cognitively with technologies (Christakis, 2014; Wainwright & Linebarger, 2006). In doing so, educators can intentionally use technologies to support the unique and often individual learning needs of their students (NAEYC, 2012).

1.3 The current study

To better understand the ongoing and often unsuccessful efforts to integrate educational technologies into teaching and learning at school, and the potential positive and negative effects of technology integration on children's well-being, this study investigated the following research questions: (a) what are children's lived experiences with educational technologies in school, and (b) how do children perceive the effect of educational technology use in school on their well-being? Children's and adolescents' perspectives appear to be missing in the literature but could prove useful in understanding the impact of digital technology and media use in school contexts. Children's voices also provide a lens through which to examine school technology integration to identify areas for continued improvement in child engagement, learning, and well-being in school. Therefore, these questions provided the focus for this phenomenological study.

2. Methodology

2.1. Participants

Participants ($N = 23$) for this study were recruited from three states in the Midwestern region of the U.S. Participants were children ranging in age from 8- to 13-years with a mean age of 11.15-years. All children attended school, enrolled in 2nd (4.3%), 3rd (17.4%), 4th (17.4%), 5th (26.1%), 6th (13%), 7th (13%), or 8th grade (8.7%). Children were mostly White/Anglo American (82.6%), all of whom were native English speakers and born in the U.S. Participants' parents had a mean age of 40.22 years, ranging in age from 31- to 56-years. Parents worked a mean 39.09 hours per week with the majority of parents having either completed some/4 years of college (45%) or graduate/professional school (52%). Family income ranged from below $40,000 (4.3%) to over $65,000 (78.3%). Most children lived with both of their biological parents (87%) and had a sibling (91.3%).

2.2. Procedure

After seeking and receiving Institutional Review Board (IRB) approval, potential participants were recruited through convenience and snowball sampling at local schools, community centers, and social networks. After securing parental informed consent and child assent, parents completed a demographic survey while children participated in a semi-structured interview with a research assistant. The interview protocol was based on the protocol of the *Children's Understandings of Well-being: Global and Local Contexts* project (see Fattore, Fegter, & Hunner-Kreisel, 2014; Fattore et al., 2018). Interview questions were modified slightly for language and new questions were added specifically focused on educational technologies and school (see Appendix; Citation 3 removed for review, 2019). Interviews were conducted in person at children's homes, typically with others present in the home, such as parents and siblings. Children were provided the option of having their parent present during the interview if they wished.

Research assistants first established rapport with children and then led a short mapping exercise during which children drew places, people, and things that were important to them, which they were then encouraged to explain.

Research assistants then asked children what made them feel well or good and if they could change anything in their lives what it would be. Due to the length of the interviews (60-90 minutes), children were then offered a short break. In the second half of the interview, children were asked questions regarding different aspects or contexts (e.g. home, school, etc.) of their lives, which were followed up with specific questions for each context. Data were collected using field notes and audio recordings during the interview until saturation was reached. Audio files were transcribed verbatim following a standard protocol.

2.3. Data Analysis

This paper is focused specifically on children's comments regarding the intersection of school and educational technology. The second author read all transcripts and highlighted all parts of the interviews during which children spoke about school contexts. The first, third, and fourth authors reviewed these sections and coded school contexts, one of which included educational technology use. Qualitative data analysis of the portions of the interviews in which school and educational technology contexts intersected was then carried out by the first, second, and third authors, following Creswell and Poth's (2018) phenomenological analysis guidelines to ensure trustworthiness. The researchers have expertise in education, educational technology, child well-being, development, and school counseling. Using NVIVO 12 Mac, the first and third authors read each transcript several times, providing the opportunity for initial ideas to emerge. These ideas were captured using the annotations feature of NVIVO as a way to document our reflections of the data during the preliminary cycle of analysis.

During first-cycle coding, initial codes were generated inductively from children's comments. Second-cycle coding then occurred where the number of codes were reduced and reorganized to generate study themes.

Coding credibility was enhanced by having two researchers code each transcript, review the labels, and negotiate any differences. In addition, the second author, who also has expertise in qualitative research methodology, served as an external auditor for the study by providing feedback to the other researchers after each cycle of coding was completed (see de Kleijn & Van Leeuwen, 2018). The auditor provided by feedback by confirming the researchers' coding and providing suggestions for code and theme labels as necessary. In following this process, findings from this study have greater reliability and trustworthiness as the conclusions are derived from the data (Creswell & Poth, 2018).

3. Results

This study was focused on children's lived experiences with educational technology in school and how they perceived those technology-rich experiences to affect their well-being. Phenomenological analysis led to two distinct themes related to children's school technology-rich learning experiences: children's educational technology experiences vary based on frequency of use, and children perceived educational technology to have both positive and negative effects on their well-being, depending on integration, access, and equity.

3.1. Children's Educational Technology Experiences Vary Based on Frequency of Use

All children described examples of the technology-rich learning experiences at school using a variety of tools, including laptops, tablets, apps and Web 2.0 technologies, as well as digital books and textbooks, personalized learning technologies,

and STEM technologies. With students recruited from multiple communities, it was not surprising to find that their experiences using educational technologies in school varied based on the frequency of technology use they had at their school. Approximately half of the children described participating in classrooms where educational technologies were used frequently, where, for some but not all, every student had their own device (e.g. laptop, tablet, etc.) to use. However, the remaining half of children reported having less frequent technology-rich learning experiences, often in settings where educational technology access was limited to only a few devices or to a computer lab. In some cases, children's technology-rich learning experiences were separate from the general classroom, with students left wanting more opportunities to use digital tools. Therefore, this theme consists of two subthemes, which will be described in more detail in the following sections.

3.1.1. Children's technology-rich learning experiences in high usage contexts

In schools and classrooms where students had more frequent technology-rich learning experiences, often students in these schools were provided their own device to use as part of a one-to-one computer/tablet program. For example, participant 705 (9-year-old male) stated:

I: Do you guys use technology at school?

C: We have chrome books.

I: Every student has one?

C: Mhmm.

I: And what do you do with those?

C: We have dreambox, which is a math thing. And you can read on them, write on them.

I: And do you bring them home or do you keep them at school?

> C: Keep them at school. The only time, we can only bring them home when we are in, um, 5th grade, because we do homework on them when we are in 5th grade.

For these students, who tended to be older (ages 11-13), having personal access to a device was the gateway to other technology-rich learning experiences, such as accessing information online or in digital books and textbooks, or completing projects and assignments. Participant 719 (13-year-old female) explained how through educational technologies they "can get lots of data for projects and stuff like that instead of just like local information. We can get information from all over the world." Participant 722 (13-year-old female) had a similar experience where "in Social Studies you use it [educational technologies] to search whatever topic you're on." Some students also explained how they would go to specific websites to complete activities, such as participant 710 (13-year-old female) who shared about using IXL, a personalized learning technology, or participant 721 (10-year-old female) who shared that they used educational technologies in his social studies course to play games and that his teacher created a class Instagram "so you can take pictures of stuff and we get assigned stuff that we need to do and then we can post and like comment [on] stuff." Other children talked about how educational technologies were used to enrich their learning. For example, participant 706 (11-year-old female) shared about using a program called EPIC in school. She said, "We all have our own iPads, and that's where we see all our assignments, and we do a lot, like almost all of our work on iPads." In addition to homework, multiple students described how educational technologies were used for standardized test prep, like participant 722 (13-year-old female) who used a website called MobyMax, "which is like a learning site that preps you for tests, like the SBA [Smarter Balanced Assessment] test."

Children often shared about the educational technology activities they enjoyed. Participant 715 (9-year-old female) shared about a coding experience: “Once in gym, we had this fun [Sphero] thing, they were these little ball robot things that we got to control with a group of people from our class.” Participant 706 (11-year-old female) described how sometimes they have “pace parties, like if you are *on pace* [emphasis added] you get to have a little party and you get to play games on your iPad and stuff, and they have fun learning games.” Participant 714 (13-year-old male) explained how he enjoyed playing Kahoot, an online review game, to study for tests. He described that it is fun to play Kahoot, “because of rivalries between friends. It’s fun!”

3.1.2. Children’s technology-rich learning experiences in low usage contexts

Approximately half of children described how they infrequently used educational technologies at their school, often isolated to their computer class or the computer lab. These comments came from students who were typically younger (ages 8-10) in our sample. When these children engaged in technology-rich learning experiences, they were often similar in nature to those who had more frequent use, such as using digital tools for homework, standardized test prep, and researching information using online resources. For example, participant 709 (10-year-old female), described how “one time we had to research families...and we had to go onto the computer to do it, because we don’t really know about them,” while participant 721 (10-year-old female) shared about using a computer for a writing project she completed on animals:

I: What type of writing projects do you have to do?

C: Um, like we did an animal report.

I: Did you get to choose your animal?

C: Yes.

I: What did you choose?

C: I did a sea turtle.

I: And what did you find out about sea turtles?

C: Lots of stuff.

I: What was something that you thought was pretty incredible about sea turtles that you found out? [Long pause] I feel like I've heard that sea turtles can live to be really old. Is that true?

C: I think like 75ish, I think.

I: Can you imagine just spending your whole [life] swimming around for 75 years? And what about how big do they get?

C: 180 to 200 [pounds] something, I think.

Although most children had experiences with educational technologies at school, several shared how usage was often limited to teachers and that they would prefer to use it more frequently while at school. These comments generally emerged from younger students, such as participant 724 (9-year-old male) who explained:

C: They [teacher] use it, they use it when they are trying to. Really the only time they use it to show is basically when they're using the ummm, that thing that will make it bigger…

I: The projector?

C: Yeah, projector. That's basically the only time. Otherwise, they are teaching us with the book.

Participant 708 (12-year-old female) also explained how teachers "use their computers a lot for emails and stuff," describing that her computer teacher used PowerPoints and the Smart Board, but that "my teacher doesn't use her Smart Board very often because it's like weird. It's not really working as well." Participant 717 (9-year-old female)

explained how her class only used educational technologies in the computer lab, and that most of her subjects are "basically all like textbooks and worksheets." Participant 720 (9-year-old male) shared how educational technology use was limited to the computer lab "only one day [a week]...I have computer class on Wednesdays."

3.2. Children's Perceptions of the Effects of Educational Technology on Well-Being

As children discussed their school educational technology experiences, they also reported their perception of the effect these experiences had on their well-being (hedonic and eudaimonic). Generally, all children regardless of their age or how frequently they used digital tools at school believed educational technology had a mostly positive effect on their hedonic and eudiamonic well-being in school, especially as it related to their learning, efficacy, identity, and overall sense of enjoyment at school. Yet, there were instances where children described ways educational technologies negatively impacted their well-being. These comments resulted in two subthemes: children perceived educational technology to be enjoyable and beneficial for learning, and children reported that lack of access and appropriate integration negatively impacted their well-being. Each of these subthemes will be described in the following sections.

3.2.1. Children perceived educational technology to be enjoyable and beneficial for learning

Regardless of how often children had technology-rich learning experiences, children described the positive impact of these experiences on their hedonic well-being, with older students explaining that they felt good about its use at school. Yet, their reasons for feeling good varied. For example, participant 719 (13-year-old female) explained she felt "pretty good about it, because I get it. I don't get overwhelmed by it, so I feel pretty good," where participant 704's (13-year-old male) conceptualization of

good seemed to be more dependent on the type of educational technology used: "It depends on what kind of technology, like if they are using something to help us learn, it's like, they are using it to help [us] learn so it is okay." Similarly, participant 713 (11-year-old male) explained that he felt good about educational technology use in his school, "because I'm learning something." Participant 710 (13-year-old female) explained that using technology was more "now-a-day stuff. Instead of just books because like technology is something that all the kids in my class grew up with, so it is like more connecting." Participant 715 (9-year-old female) explained that using educational technologies made her feel "more grown up" where using paper and reading "feels like old fashioned ways."

Many children described the ways in which educational technology use at school positively affected their eudaimonic well-being. Through children's comments, this occurred in two ways where children believed that educational technologies positively impacted their learning, and that school educational technology use made learning fun.

Children shared at length about how they believed educational technology was beneficial for their learning. For example, participant 704 (13-year-old male) describe how having greater access to technologies positively impacted his learning by making a comparison to a time before technologies were ubiquitous. He stated: "Definitely, because Laura Ingalls Wilder had to do stuff in her head and write it all down on paper. With technologies and calculators, you can use those for math, like dictionaries online, so technology definitely affects your learning." Participant 716 (11-year-old male) explained learning with educational technologies had a positive impact, because "it's better than reading out of a textbook...is better than doing a worksheet."

Many students described how educational technology use made school fun. For some students, like participant 706, using educational technology was fun, because

learning became more fun "instead of pencil and paper" that are characteristic of traditional non-technology-rich learning experiences. Fun for several students also meant playing educational technology-based games either independently or as a class, like participant 723 (11-year-old female) who said that "you get to play games on it [educational technology] and it's just fun." As students described what they considered fun educational technology use, they also expressed a sense of excitement, with multiple students explaining it made them feel "awesome! [emphasis in original]" or like participant 715 (9-year-old female) shared:

> C: Well, when we got computers in third grade, I was like WOW! [emphasis in original] We get computers? Like our own very own computers?
>
> I: So, you were excited for using computers?
>
> C: Yeah.

3.2.2. Children reported that lack of access and appropriate integration negatively impacted their well-being

Even though several students felt positive about their educational technology experiences, there were also negative feelings associated with technology use related to both their hedonic and eudaimonic well-being. As students shared their experiences in this area, they shared about specific examples of negative effects on their eudaimonic well-being that in turn negatively impacted their hedonic well-being. For example, participant 715 (9-year-old female) described the following experience where she was frustrated with the use of educational technology and how her teacher did not challenge her enough:

> I don't really like watching the videos to help us with math that we have. Cause they are just videos that we already know...like if Josh has um 45 apples and he wants to share them with five friends, how many will each friend get?

> Everybody knows that, it's nine. She has already taught us all that stuff and she still gives us, and our teacher still gives us videos and we already know.

It is clear in participant 715's (9-year-old female) comment that there is a desire to be challenged more while using educational technologies, which relates to her eudaimonic well-being. It is also equally clear that this participant's hedonic well-being has been impacted as well as evidenced by the frustration and dislike for how educational technologies were used. Participant 709 (10-year-old female) also expressed frustration regarding potential inequities between student and teacher technology use. She explained:

> If they [teachers] are on their phones and stuff, it's just kind of rude, because they always tell us how we can't have our phone, but then they sit at their desks while we are working and they're just on their phone. I just think it is kind of weird.

In participant 709's (10-year-old female) experience, the rules surrounding teacher and student use of technologies at school impacts students' eudaimonic well-being in several ways (relationships, personal growth, autonomy). Yet, her comment also indicates an impact on her hedonic well-being as a result, with teachers being "rude" in their use of technology and rules being "weird". Finally, hedonic well-being was negatively impacted when educational technologies were used for standardized testing and test prep. For example, participant 724 (9-year-old male) explained how he felt "a little bit nervous" when completing a standardized test on the computer, an indicator that his overall life satisfaction had been reduced.

3.3. The essence of children's educational technology experiences and their well-being

In this study, regardless of how frequently educational technologies were used at school, children described what they believed to be positive technology-rich learning experiences. Older students tended to describe their use of educational technologies at school as happening more often, which they believed to be beneficial for their hedonic and eudaimonic well-being, including their learning, their current knowledge and technology skills, and their identity. Children with more limited access tended to be younger where educational technology use occurred outside the general classroom in a computer lab or as part of their computers class. Although younger students had fewer opportunities to use and learn with educational technologies, like older students, they too believed that learning with digital tools was beneficial for their well-being. However, many of these younger students also shared ways in which their hedonic and eudiamonic well-being was negatively impacted, largely stemming from their perceived limited access to digital tools, what they believed were inequitable rules or expectations for teacher and student technology use, as well as in their opinion ineffective technology integration resulting in a lack of rigorous cognitive engagement. Regardless of how much technology use students reported, most expressed a desire for more usage at school.

4. Discussion

The purpose of this study was to (a) determine children's lived experiences with educational technologies in school, and (b) how they perceived the effect of educational technologies in school on their well-being. While other studies have explored the role of educational technologies and how it impacts children's well-being, few have done so from the child's perspective. These findings unveiled several important implications for teachers, school administrators, and researchers, which will be discussed in the context of each research question in the following sections.

4.1. Positive & Limited School Educational Technology Experiences

The first research question involved understanding children's lived experiences with educational technology in school as a way to better understand how these tools have been integrated into instruction. Children reported having positive and enriching experiences with educational technology at school, such as research projects on families and animals, or use of an online learning platform to facilitate activities and assignments. Additionally, children thought that when educational technologies were used, it was supportive of their learning and they desired more technology-rich learning experiences at school. This is a positive finding, because it is an indicator that as schools have continued to invest in educational technologies over the years, that these children's teachers are finding ways to integrate technologies to support learning. This is especially important given the historical struggle schools and teachers have had with technology integration (Cuban, 1986, 2002; Reeves & Reeves, 2015). Simply, school technology integration is happening, and it is happening in ways children perceive as positively impacting their learning. As schools continue technology integration, of specific interest for future research is the extent that technology-rich learning experiences are supportive of constructivist and 21st century learning principles, which teachers sometimes struggle to incorporate (Fishman & Dede, 2016; Fishman et al., 2004; Jonassen, 1995) and was beyond the scope of this study.

Yet, children in both high and low usage contexts expressed a desire for additional educational technology experiences in school. This was especially true in low educational technology usage contexts where multiple children shared how school educational technology use was often limited to their computer course or located in the computer lab, or how their teacher used technologies but students did not. This, too, is an important finding, because it demonstrates, from the child's perspective, that

technology integration still has yet to make its way fully into the general classroom, a historical challenge in schools (Cuban, 1986; Cuban, 2002; Kirkwood & Price, 2013; Reeves & Reeves, 2015; Spector & Anderson, 2000). Therefore, we recommend teachers, administrators, and other stakeholders work together to develop a common vision of successful technology integration that holistically meets the needs of today's learner. Having this common vision will likely prove to be helpful as teachers engage in professional dialogue and growth about their teaching with educational technologies (Tondeur et al., 2017). We also recommend school administrators, teacher educators, and other key stakeholders continue professional development efforts to support more widespread technology integration in teaching and learning, specifically attending to the barriers teachers encounter as they may be the driver of limited technology integration in the general education classroom (Ertmer et al., 2012; Tondeur et al., 2017).

Many children in this study described what the authors believe is a high level of educational technology access. Multiple children shared about several digital tools they used at school, such as one-to-one laptop programs, interactive whiteboards, and Web 2.0 technologies. However, for many children the context where these tools were typically used was not the general classroom, an indicator teachers may be choosing to not use educational technologies in their lessons. This is consistent with other literature in which teachers' beliefs about educational technologies and learning were found to limit their classroom integration of technologies (Ertmer et al., 2012). Therefore, we recommend school administrators, teacher educators, and researchers continue to explore ways to foster positive teacher beliefs regarding technology integration in the general classroom. In doing so, we encourage educators to reflect on the knowledge, skills, and beliefs they bring to the classroom. If digital technologies and media have a central role to who children are, it makes sense that teachers would consider the role of

these tools in the lessons they create and teach. It was clear in this study that children wanted more technology-rich learning experiences, especially those that were cognitively rigorous, and viewed the use of educational technologies as beneficial for their well-being. It is here where teacher professional development will likely be critical as teachers seek to reflect on and implement potentially new pedagogy that takes advantage of how people learn, target 21st century competencies, and leverage their students' strengths (Fishman & Dede, 2016; Fishman et al., 2004; Jonassen, 1995). Doing so will likely take significant effort, investment, and time, but is likely worth the dividends if children's school experiences are enriched in ways that support their future success.

4.2. Impacts of Educational Technology Use & Children's Well-Being

The second research question involved understanding how children perceived the effect of school-based technology use on their well-being. Although digital technologies and media use in some contexts may have a negative effect on children's well-being, such as exposure to negative content like body-image distortions, physical health, and interactions with strangers (Brown & Bobkowski, 2011; Chau, 2014; Levine & Harrison, 2009; NAEYC, 2012; Papdakis, Kalogiannakis, & Zaranis, 2018; Sargent et al., 2006; Ward & Friedman, 2006), school is a place where digital technology and media use appears to have mostly positive effects. Children's comments indicated they perceived that educational technologies affected their well-being in mostly positive ways, but that there were some negative effects as well. The presence of both positive and negative effects is not surprising given the debate in the field regarding whether or not educational technologies are helpful or harmful to children's well-being (Orben & Przybylski, 2019). The positive effects children shared show technologies are a central part of children's lives and who they are is likely why children thought learning with

educational technology was fun. These findings confirm those of others (Brown & Bobkowski, 2011; Citation 4 removed for review, 2018), but do so from the child's perspective, a perspective that is currently lacking in the literature. In light of these findings, we recommend that as teachers decide to integrate technologies into their instruction, they do so with the identity of their students in mind. If technologies are a central part of children's identity and ultimately an intrinsic motivator (Brown & Bobkowski, 2011; Fitton et al., 2013; Hsin et al., 2014; Michikyan, Dennis, & Subrahmanyam, 2014; Ofcom, 2015), by creating technology-rich learning experiences children will be more likely to fully engage in learning and potentially have greater learning success, an association that has been found in prior studies (Aladé et al., 2016; Huber et al., 2016; Kowk et al, 2016; Tarasuik et al., 2017; Schroeder & Kirkorian, 2016). We recommend future research be conducted to explore how best to support teachers as they first listen to the voices of their students and subsequently act upon that information. Doing so would be valuable for other teachers and teacher educators as they seek to integrate technology into their own or their teacher candidates' instruction in developmentally appropriate ways (NAEYC, 2012).

Children's comments also pointed to frustration with how educational technologies were used in superficial ways or with how children perceived an inequity regarding the rules for children's technology use and teacher's rules. These areas of impact are not often discussed in the research literature but are important, because the focus of the research literature tends to be on the negative contributions of technologies on children's and adolescents' emotional, physical, mental, and social well-being, rather than on issues of teacher-student equity and effective technology-rich instruction that emerged in this study. Therefore, we encourage teachers to consider developing technology-rich learning experiences informed by ongoing formative assessments of

student knowledge so that these experiences better align with students' intellectual needs and positively impact their hedonic and eudaimonic well-being. We also encourage teachers and administrators to consider the ways in which more equitable policies can be implemented related to student technology use in school. Doing so likely would promote a more positive community and culture within the school. Finally, we believe additional research needs to be completed to fully explore how children perceive educational technology use in school as negatively affecting their well-being, specifically those projects investigating how children conceptualize (a) meaningful technology-rich instruction and (b) inequities in school-based educational technology use. These topics should provide both positive and negative insights on how educational technologies effect on children's and adolescents' well-being, likely proving useful for teachers as they participate in professional development and make decisions on technology integration.

5. Limitations

As with all studies, there are limitations that create the bounds through which we interpret and understand the findings. One limitation of our chosen methodology is that qualitative studies are intended to allow for rich description of a particular context, and not to provide broadly generalizable findings (Creswell & Creswell, 2018). Because this study took place in the Midwestern region of the U.S. and was primarily a rural, white, educated, higher SES, native English speaking, two parent household sample, the views and experiences held by study participants likely do not represent those from other regions of the U.S. and other nations. To provide a more comprehensive understanding of the topics and issues discussed in this paper, researchers may wish to conduct similar studies in other locations, or choose alternate methodology as there may be important gender and racial differences in children's use of educational technology (Jackson,

Zhao, Kolenic, Fitzgerald, Harold, & Von Eye, 2008). Another limitation of this study was the focus of the interview questions, through which the researcher asked participants more about what made them feel good than bad. As a result, there is a potential bias inherent to the interview protocol that may have resulted in participants providing more information about positive than negative technology interactions. Therefore, in future studies, researchers should seek to understand the effect in a balanced way by asking children and adolescents questions regarding both positive and negative effects. Doing so would likely help move the field forward in its understanding of educational technology and children's well-being from the unique perspective of the child. Finally, the open-ended nature of the interview itself was a limitation to the study and could result in a response bias where participants may have responded in ways they believed was socially desirable. The researchers did attempt to reduce response bias using strategies such as establishing rapport and explaining there were no right or wrong questions, but it is possible this bias still remained. Researchers should be cognizant of this issue in future studies and seek to lessen this risk.

6. Conclusion

We live in a society where digital technology and media ubiquity is the norm for most families. Technologies are everywhere we go and almost invisible at the point of interaction, so much that for many people, using digital technology and media has become routine. As educators and researchers continue to explore and study technology integration and its impact, it is important to do so with children's perspectives in mind. We set out to better understand children's lived experiences with educational technologies in school, including their perceptions of how that use impacted their well-being. We learned children used educational technologies at school in several ways they generally believed positively impacted their well-being. Yet, most experiences with

educational technologies appeared to have occurred outside the general classroom, an indicator that technology integration is still very much an ongoing effort. As schools continue to invest in and support teacher technology integration, perhaps most important will be reducing the barriers teachers encounter. This can likely only be accomplished through expanded professional development opportunities where teachers gain not only the knowledge and skills needed to use educational technologies during instruction, but also the motivation to do so. Influencing teacher motivations and ultimately their beliefs is a difficult task, especially when so much is already asked of teachers. Therefore, this becomes the responsibility of all stakeholders, where the voices of children are elevated, and the needs of teachers met in an effort to prepare children for a successful and digitally rich future.

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Appendix

Interview Protocol and Notes: Short Form

Qualitative Study of Children's Well-Being: U.S.

REV 02-17; REV 1-19-2020

Adapted from Fattore, Fegter, & Hunner-Kreisel, 2014; Fattore et al., 2018

Fattore, T., Fegter, S. & Hunner-Kreisel, C. (2014). Interview protocol and notes: Children's understandings of well-being: Global and local contexts. Stages 1 and 2. Berlin, Sydney, Vechta, AU: Author.

Fattore, T., Fegter, S., & Hunner-Kreisel, C. (2018). Children's understandings of well-being in global and local contexts: Theoretical and methodological considerations for a multinational qualitative study. Child Indicators Research, 12(2), 385-407. doi:10.1007/s12187-018-9594-8

Project Coordinators:

[REMOVED FOR REVIEW]

Fieldwork Considerations

Documenting Field Notes

Field notes will be obtained to provide information regarding the fieldwork setting. Observation-based field notes will be critical in analysis of the methodology and for documenting the challenges, processes and mechanisms through which the qualitative research is undertaken. For example, field notes allow for a comparative analysis of what concepts, methodologies and methods 'work' or are adapted across different fieldwork settings.

It is suggested that observation-based field-work notes be obtained on the following:

- *Demographic details:* time, place, date of the fieldwork.
- *Descriptive notes:* a description of the physical setting, participants, and accounts of particular events or activities taking place at the time of data collection.
- *Personal notes:* any salient fieldworker reflections – for example speculations, feelings, problem, ideas, hunches, impressions.
- *Research modifications and reflections:* Changes to suggested questions and processes. What worked and what didn't.

More information on field notes can be found at http://www.qualres.org/HomeFiel-3650.html
And https://assessment.trinity.duke.edu/documents/ParticipantObservationFieldGuide.pdf

Obtaining Demographic Data

Demographic data will be obtained to provide basic information regarding the participants, the context in which the field-work occurs and the socio-economic and demographic context in which the participants live. This information will be crucial for attempting to understand the importance of local cultural, social, and political contexts as factors influencing children's understandings and experience of well-being.

It is recommended that several sources be collected, where possible

- *Area field-notes:* An observation based description of the socio-economic and demographic characteristics of the fieldwork setting. This will provide critical information on the demographic context of the fieldwork and potentially the demographic characteristics of the environment in which the participants live.
- The appropriate version of the *Children's Worlds* questionnaire (for children in grade 3, 5, or 7, or age 8-9, 10-11, or 12-13). This could be self-administered, with parents reading the instructions to children, or administered as a face-to-face questionnaire, with the fieldworker presenting the items orally.
- A question on children's self-concept (see Question I.I below) with selected items from the 'About You' survey, which obtains basic demographic data on the participants, used as a rapport-building exercise.
- Qualitative child interviews, part 1 and 2, with a break in between.

Interview Step 1: Exploring Children's Concepts of Well-being

Step 1 involves individual interviews with children using open-ended questions about important places, important people, important activities and so on, from their perspective.

The purpose of this step of the research is to work inductively from children's narratives to identify key concepts regarding well-being as experienced in their everyday contexts.

A 'Map exercise', is used to explore children's own experiences of well-being in step 1. It therefore is premised on an open sense of what is important and what makes children feel 'well or good' within the parameters of everyday life.

The questions below are designed to elicit narrative responses from the participants. Therefore they should be read as guides to facilitate open-ended responses from the participants. For each of the questions, the suggested prompts can be utilized to facilitate open-dialogue between the researchers and the participants. These are suggested in the table below.

Question	Notes
I.I. Self-concept First, we would like you to tell us a little about yourself. How would you describe yourself? 1. Do you have any hobbies? If so, what are they? 2. If you have any hobbies, do you do them through a club or organization? 3. How else do you like to spend your free time? 4. How much you like to read? What do you like to read? Do you tend to read paper books, e-books/using devises like an ipad, or some other way? Explain. 5. How much do you like to do activities like board games, puzzles, art, or looking at pictures or photos? Please explain. 6. How much do you like to do activities using technology or media, such as playing on the computer, watching TV, playing video games, using tablets or iPads, or using cell phones? What do you use them to do? Please explain. 7. Do you have a religion? If so, what is it? 8. Do you have pets? If so, what pets do you have? 9. Is there anything else you would like to tell us about yourself?	This question prioritizes what children see as important to self- concept. Their age, gender, cultural background etc.

I.2 Mapping important aspects of well-being
Map Exercise - Invite children to draw a map of what is important in their life. For example children could be invited to highlight on their map:
• The places that are important to them;
• The people who are important to them;
• The things they do that are important to them;
• Particular things that they own that are important to them;
• Anything else that may be missing of importance that they wish to include.
 	
The activity forms the basis of a semi-structured interview. The Participants should be prompted to discuss and explain the content of the map. BE SURE TO AUDIOTAPE THE ENTIRE PROCESS.
 	
For example, for any of the features included on the map, participants should be asked to describe what the feature is, and what about that feature is important, and therefore the reasons they have included it on their map.
 	
Field workers will probe the content by asking about key aspects of the presented content. The following prompts can be used:
• Tell me something about (*feature on map*)
• Is there a specific situation or occasion that you could describe about (*feature on map*)? Could you describe this in more detail to help me understand (*feature on map*)?
• When you talked about (*story told about feature on map*) what happened next?
• How was that for you?
	The activity provides a representation of a particular point of view (as explained and interpreted to us by the participants), as a manifestation of the young person's way of looking at, experiencing and interpreting the world. As much as possible the parameters of the map should be determined by the participants, The process of developing the map should be child-led rather than directed by the researchers. G uidance can be provided by using the prompts below.
	
	• Decide what you want to make (draw/build etc.) a map of. It can be your home, your local area or your town or something else. If you want to you can do more than 1 map. For instance you could draw a map of school, a map of your house and some maps of places you like playing. You can make a personal map. This includes making a map of things around you in your everyday environment.
	• If you want to, write or draw on your map all the things you want to put on your map that are important to you. Think about the places on your map where you would like to put these things. You don't just have to put physical things on your map. You can put on anything that you can find a symbol or picture for, or even write on. For instance you could include:
	  ○ People important to you.
	  ○ Activities that you do that are important.
	  ○ Places you go that are important to you. What do you do at these places?
	  ○ Things you own that are important to you.
	• Work out the basic layout of where you want to put these things.
	• Decide how you want to put these things on your map.
	• Make as many changes as you like.

I.3 Mapping what makes children feel well We have talked about what is important, looking back at your map, please tell me what makes you feel well or good? *Prompt* - Are there particular people who help you feel well or good? What is it about these people that makes you feel well or good? - Are there certain things that you do that make you feel well or good? What is it about these things that make you feel well or good? - How about certain times? Tell me about them? - Can you describe a specific occasion when you have felt well or good? Are there other occasions? - Are there particular places? - How about particular things that you own? What is it about these things that makes you feel well or good? - What else needs to be in your life to make you feel this way? Is anything missing? If so, please describe to me what else you would like in your life to help you feel well or good.	The concept of 'well or good' switches to the emotive/affective experiences of well-being. Similar to the importance question, the activity should serve as a medium for children to focus their ideas, and then serve as the basis for a discussion where the researcher obtains participant's interpretations.

I.4 Changing important aspects of well-being	
Imagine you had a magic wand and could change whatever you wanted. ▪ Looking at all these things on your map, what would you change if you could to make it even better? ▪ *Prompt* ▪ Would it be the people you were with or the things that you were doing? Is it something else? Please describe what you would change.	This question attempts to focus on both ideal aspects of life quality but also what children identify as areas in their life that they wish to change. The question potentially explores the extent to which children adapt their preferences to existing situations, and what they would prioritize as requiring change. As an alternative it may be more appropriate to talk in terms of 'power to change things'

BREAK----------

Step 2: Exploring Children's Understandings of *Children's Worlds*

Study Concepts and Reconstructed Concepts from Step 1

While Step 1 focuses on children's concrete experiences and concepts, Step 2 aims to explore children's understandings of the concepts that have arisen in the first interview in a more detailed way and also children's understandings of some of the salient domains and concepts used in the *Children's Worlds Study.*

Module 2.2		
2.2.0 Home and family	Next we are going to talk about how you feel about being a child in (child's city/town). We are going to start by talking about your home life and family. • We want to hear more about important people in your life. How about family relationships? Is family important in your life? • Why or why not? • What kinds of things do you do with your family? • What are your favorite things to do with your family? Why? • What kinds of things do you do with your *whole* family? • Are there things that you do with your dad only? Why? • Are there things that you do with your mom only? Why? • List 5 words that describe your dad. List 5 words that describe your mom. Explain. • How do you feel about your family? • What are the most important things about your family? • What is the best part about being in your family? • What are some of the challenges? • Are parents important in your life? • What makes a good parent? • What makes a good family?	2.2 to 2.6 refer to underlying domains or concepts derived from the *Children's Worlds Study*, which have not been explicitly asked about in Step 1. These questions are not definitive and local adaptations are encouraged.

2.2.I School	• How do you feel about school? • What are the most important things about school? • What is the best part about school? • How about the worst part? • How about teachers? Are teachers important in your life? • Why or why not? • What makes a good teacher? • How much do you use technology (e.g. computers or tablets) at school)? If you do, what kinds do you use? How do you use them? What kinds of things do you do with them? • How do you feel when you use technology in school? • Do you think technology affects your learning in school? • Do your teachers use technology when teaching? How? How does it make you feel when they use technology in teaching? • How much do you use books at school? If you do, what kinds of books do you use? How do you use them? What kinds of things do you do with them? • How do you feel when you use books in school? • Do you think books affect your learning in school? • Do your teachers use books when teaching? How? How does it make you feel when they use books in teaching? • How much do you use other learning materials or activities (e,g. games, photos, art, or writing materials) in school? If you do, what kinds of materials or activities do you use? How do you use them? What kinds of things do you do with them? • How do you feel when you use other materials or activities in school? • Do you think using these things affects your learning in school? • Do your teachers use other activities or materials when teaching? How? How does it make you feel when they use other materials or activities in teaching? • Is there anything else that you think affects your learning in school?	

2.2.2 Money and things you have - Economic Well-being	What sorts of things do you think it is important for children to own or to have? *Prompts* • Basic necessities? Personal items? How about things like phones or computers? Books? Other things? • Do you think that it's important to have a certain standard of living? Why/why not? (you may have to explain to them what these terms mean) How about having your own money? Is it important for children to have their own money? *Prompts* • Why so? Or why not? • What do you spend your own money on? How does it make you feel? • How do you get your own money? What is it that you think families need to have a good life in terms of money and owning things? *Prompts* • Basic Necessities • Own transportation, like a family car • Owning a home • A television at home • What do families need to do to make sure they have enough? • Etc.? How about not having enough money? Is this something children worry about?	The prompts included are quite general and are only intended to trigger further discussion rather than being a definitive list. Like the other questions, this question is intended to be the basis of a conversation that obtains what children prioritize as important to them. In this case specifically regarding: • Things they own or would like to own • Family standard of living

2.2.3 Being Listened to	Lots of people talk about listening to what children have to say. We are really interested in whether you feel listened to and when you feel your opinions matter. Can you tell us about a time when you felt your opinion mattered? How about a time when you felt someone was really listening to you? • How about at home? Do you feel this way at home? • How about at school? • Are there other situations you feel as though you felt listened to? • Are there situations where you would want to be listened to more?	Questions 2.4 to 2.6 deal explicitly with underlying concepts central to the domains identified in the *Children's Worlds Study,* that of 'Being Listened To', 'Participation' and 'Safety'.
2.2.4 Agency	We have talked about whether children feel listened to, but we are also interested in when children feel free to do things that they want to do. When do you feel free to do the things you want to do? Can you describe a time or a situation where you have felt free to do what you want to do? Tell us about it. *Prompts:* • How about space for yourself? [see which contexts are prompted by this question - home, school, etc.?] Are there situations where you would want more freedom [to be able to do what you want]?	

2.2.5 Safety	What does being safe mean to you? What is it that makes you feel safe? *Prompts* • Are there particular people that make you feel safe? • Are there certain things that you do? • How about certain times, like times of day or week? • How about certain occasions? • Are there particular places you feel safe (How about places in your neighborhood or town)? • How about particular things that you own that help you feel safe? • How about at school? • Do you have any other ideas on what it is that makes you feel safe?	Picture elicitation can also work for this question (and also for others). Here the participants are asked to choose a picture or pictures that they associate with safety. This could be from a range of stock photos of everyday situations or items provided by the researchers. Participants are then asked what is it about these images that they associate with safety and the reasons they chose the picture, leading to further discussion.

	Module 2.3	
2.3.l Mapping exercise of daily activities - What is it like being a child in [place]	Step1: Imagine you are a teacher and you wanted to explain to children about what it is like being a child in [place]. You are doing this so children in other parts of the world - children who have never been to [place]- can find out what it is like to be a child in [place]. What would like to share with them?	
	Wrap-up Question to be used at end of Step 2	
Concluding question:	Thank you for your time and sharing your ideas with me. Is there anything else that you would like to tell me?	