Educators Perception of Student Digital Citizenship Practices

*Florence Martin, Ph.D.
University of North Carolina Charlotte
9201 University City Blvd
Charlotte, NC 28223
Ph: 704-687-8869
Florence.Martin@uncc.edu

Tuba Gezer, M.Ed.
University of North Carolina Charlotte
9201 University City Blvd
Charlotte, NC 28223
tgezer@uncc.edu

Chuang Wang, Ph.D.
University of North Carolina Charlotte
9201 University City Blvd
Charlotte, NC 28223
Cwang15@uncc.edu

* Corresponding Author

Funding: This work was supported by the National Science Foundation, SAT-C Award Number: #1723746

Total Word Count: 6800 words (excluding cover page)

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Abstract

Digital citizenship, defined as exhibiting appropriate and responsible behavior with technology use, is an essential component of technology education. The purpose of this study is to examine K-12 educators' perceptions of their students' digital citizenship knowledge and practices of cyberbullying, digital footprint, digital privacy, digital netiquette, and digital identity. One hundred and seven educators responded to the survey on digital citizenship practices. Based on the educators' perception, student practices on digital citizenship were rated as “not well” for most of the items on the survey. While educators' perceptions of their students' digital citizenship practices did not vary among school levels or based on their roles as teachers or technology coaches, educators who taught digital citizenship had higher perceptions of their students' digital citizenship practices.

Keywords: digital citizenship, cyberbullying, digital netiquette, digital footprints, digital security, and digital identity

Educators Perception of Student Digital Citizenship Practices

K-12 students are engaged with technology at a very early age, which causes a safety concern in the online environment. Digital citizens are those who exhibit the norms of appropriate, responsible behavior with regards to technology use (Ribble, 2014). International Society for Technology in Education (ISTE) lists digital citizenship as an essential aspect of educational technology that educators are now held responsible for teaching it to their students. Ribble and Bailey (2011) define digital citizenship to include the concepts of responsibility, rights, safety, and security. Ohler (2011) stated that digital citizenship is a sort of character

education in the digital age while Jones and Mitchell (2015) defined digital citizenship as "practice respectful and tolerant behaviors towards others and increase civic engagement activities" (p.2065). In their study, Jones and Mitchell found that online respect scores decreased with the increase in age and also found that girls scored higher on the digital citizenship scores compared to the boys. Gleason and von Gillern (2018) concluded in their article that social media-enabled digital citizenship requires following a curriculum to introduce opportunities for learning citizenship and civic education via software, games and other digital media applications for high school students.

The use of technology in the K-12 classroom has increased dramatically. Tablet computers are used to improve the efficiency of educational activities (Gungoren, Bektas, Ozturk & Horzum, 2014). Using 1-to-1 laptops in middle school classrooms are changing the nature of the classroom activities as more small-group work, and effective and frequent communication between students occurs (Shapley, Sheehan, Maloney, & Caranikas-Walker, 2011). Similarly, Khlaif (2018) analyzed teachers' perspectives on adoption and acceptance of tablets into classrooms and concluded that the majority of the participants claim tablets benefit classroom activities, collaboration, and debate among peers. Also, there was an increase in the use of smartphone by K-12 students (Chan, Walker & Gleaves, 2015; Sung, Chang & Liu, 2016). However, with the increased use of technology comes the challenge of teaching students to model appropriate and responsible behavior online.

Digital Citizenship Practices

Digital citizenship is multidimensional and includes knowledge, attitude, and behavior, necessary to emphasize all factors in digital citizenship education (Kim & Choi, 2018). Digital citizenship education goes beyond duty or responsibility and focuses on instituting self-identity,

belief, protection and healthy digital use characteristics in the learner (Kim & Choi, 2018). Many factors affect teachers' decisions on integrating technology. The principal's technology leadership attitude affects teachers' decision to integrate technology in the classroom. Professional development can also be a moderator in this relationship of teachers' preference to integrate technology (Thannimalai & Raman, 2018). Cristol and Gimbert (2018) found a strong relationship between teachers' internet self-efficacy and digital citizenship. They also found that teachers' years of work experience, use of social media for teaching, and internet self-efficacy significantly influenced teachers' perceptions of digital citizenship. Their study offered recommendations for educators for the skills and behaviors needed to be digital citizens.

There is a need to examine digital citizenship practices based on teacher perceptions and practices. Pusey and Sadera (2012) concluded that teachers are not prepared to provide lessons or serve as role models for digital citizenship. According to Hollandsworth, Dowdy, and Donovan (2011), parents, technology professionals, and teachers should be a part of digital citizenship education. Similarly, triangulated communication between student, school, and home, and consistent technology rules are essential (Mark, & Nguyen, 2017) for responsible technology use by students. Given the fact that teachers should support students as mentors or consultants regarding digital citizenship, teachers need to know the risk and benefits of the digital age (Kim & Choi, 2018). Xu, Yang, MacLeod, and Zhu (2018) examined digital citizenship among preservice teachers and communication skills and found that 10 interpersonal communication competence (ICC) were predictors of digital citizenship, which are empathy, assertiveness, interaction management, supportiveness, environmental control, self-disclosure, social relaxation, altercentrism, expressiveness, immediacy. Their study reinforced the importance of ICC skills in mediated behavior and provided recommendations for improving pre-service

teachers' digital citizenship behavior, which can influence their future students. Using survey and interview data, Hollandsworth, Donovan, and Welch (2017) found that educational initiatives on digital citizenship should start in earlier grades, especially training on the appropriate use and netiquette of technology that inform students on the creation of digital footprints.

Digital Citizenship Standards and Curriculum

International Society for Technology in Education standard 2 for students focuses on the student being a digital citizen (ISTE, 2019a). The standards state “Students recognize the rights, responsibilities, and opportunities of living, learning and working in an interconnected digital world, and they act and model in ways that are safe, legal and ethical” (p. 1). Similarly, the ISTE standards for Educators focuses on Digital Citizenship (ISTE, 2019b). The standards state, "Educators inspire students to contribute to positively and responsibly participate in the digital world” (p.1). The substandard for both the students and the teachers focus on aspects of digital netiquette, digital identity, digital security, digital privacy, and cyberbullying. These standards demonstrate the importance of digital citizenship in today's education. In addition to the standards for students and teachers, ISTE also has standards for coaches who are technology facilitators in educational settings. The standard 5 for coaches on digital citizenship states “Technology coaches model and promote digital citizenship” (ISTE, 2019c, p.1).

The research on examining teachers’ conceptualization of 21st century competencies proposed new curriculum. The curricula has six dimensions including digital literacy, innovative thinking, critical thinking, digital citizenship, self-regulated learning, and computer-supported collaboration (van de Oudeweetering & Voogt, 2018). Common Sense Media is another free and comprehensive curriculum that includes class activities, lesson plans, and various videos for teachers on various digital citizenship topics (Common Sense Media, 2016). This curriculum

provides resources for students, teachers, and parents regarding the safe and responsible use of technology. The iSafe project provides K-12 lesson plans on topics such as appropriate online behavior, social networking, chat rooms, and cyberbullying (ISAFE, 2000). The Internet Safety TaskForce at Harvard University has created resources for providing a safer internet environment for youth (Internet Safety Technical Task Force, 2008). While there are a few curricula that have been designed and implemented in today's classrooms, students and teachers practices on digital citizenship remain understudied.

Theoretical Framework

Digital Citizenship is described in this study as responsible digital habits for students to function in a digital world. The following five elements of digital citizenship from Ribble's framework (2014) are investigated in this study (Table 1).

[Insert Table 1 Here]

Cyberbullying

Cyberbullying is bullying that takes place over digital devices like cell phones, computers, and tablets. While examining teachers and principal candidates' preparation of cyberbullying, it was found that the candidates are aware of different types of bullying and the effect of bullying on students (Styron, Bonner, Styron, Bridgeforth, & Martin, 2016). However, Styron et al. (2016) were less confident in methods to help students deal with bullying. Dehue, Bolman, and Völlink (2008) found that most cyberbullying occurs outside of school. However, previous research found that the triggering event often occurs at school and continue when students are at home (Cassidy, Jackson, & Brown, 2009). Whether at home or school, cyberbullying needs to be addressed by both parents and teachers, and the student's internet usage needs to be monitored (Juvonen & Gross, 2008)

Digital Footprint

A digital footprint is a trail of data one creates while using the Internet. The concern of digital footprint grows as students showcase various aspects of their life online (Camacho, Minelli, & Grosseck 2012). Kuehn (2012) explains how every click, every online post, or every "like" to a picture or a status could result in a digital footprint. Eighth-grade students were able to track the digital footprints that they had created on Facebook or other online sources when they googled their name (Miller, 2016). Schools have implemented safety policies related to the Children's Internet Protection Act (CIPA) and the Children's Online Privacy Protection Act (COPPA). However, with the increase in the device usage in schools, and the easy access to the apps and websites, it is easy for students to leave a digital footprint. Researchers have examined digital footprints that students leave. Some researchers have detected students' footprints to cause distress (Ophir, Asterhan, & Schwarz, 2019) but at the same time, they have also examined digital footprints to promote critical thinking and engagement (Ferreira, 2015).

Digital Privacy

Digital Privacy refers to the privacy of the digital information shared. As school districts filter inappropriate words and websites because there is a safety concern of emails and chat rooms (Miller, 2016). The author further suggests that teachers should collect written consents from parents if the students have to create an account to use a website, especially for students under 13 years old. Considering students' digital privacy, teachers need to have an adequate understanding of digital privacy to support their students. Sometimes teachers create a class account and share the link with students. Teachers need to review the privacy policies and avoid websites which require students' names and email addresses (Miller, 2016).

Digital Netiquette

Digital netiquette refers to the formal or informal rules that apply when communicating online. Being kind and critical during online disagreements are healthy and productive (Kryder, 2013). Although 69% of teens indicated that they are usually nice to others while using social media, 88% of teens report seeing other people being mean or vicious while using social media. The same study reported that 15% of teens being the victim of online meanness, and they also found that there was a significant relationship between socioeconomic status and parents' involvement with digital netiquette (Lenhart et al., 2011). In another study, Wang and Xing (2018) emphasize the importance of parental involvement to educate teens to become digital citizens. They found that when parents were more involved in their teens technology use, the teens demonstrated high level of digital netiquette.

Digital Identity

Digital Identity refers to how one perceives oneself and how others perceive individual's online activity. Compton-Lilly (2006) describe digital identity as, "we view ourselves and represent our knowledge, experiences, and social connections" (Compton-Lilly, 2006, p.400). According to ISTE 2016 standards, students are expected to understand the permanence of their digital action and manage their digital identity and reputation accordingly. Wise and O'Byrne (2015) recommend three different classifications of identity construction, embrace similar identities, establish separate identities, or resist creating an online identity. As digital identity includes establishing beliefs and self-identity to healthy usage of digital tools, digital education should provide students opportunities to develop their digital identity (Kim & Choi, 2018).

Purpose of this Study

Although teachers' awareness of digital citizenship has grown, digital citizenship interventions and opportunity at schools have not changed much (Hollandsworth et al., 2017).

There is a gap in the research on educators' perception of digital citizenship practices of their students. In this study, we examine K-12 educators' perception of their students' digital citizenship knowledge and practices based on grade level they teach, and educator roles. The following research questions are examined.

1. What digital devices do K-12 school students use at school?
2. What are educators' perceptions of their students' digital citizenship practices (cyberbullying, digital netiquette, digital footprint, digital privacy, and digital identity)?
3. Do educators' perceptions of their students' digital citizenship practices vary between school levels?
4. Do educators' perceptions of students' digital citizenship practices differ based on their experience teaching digital citizenship, after controlling for the number of years teaching?
5. Are there any differences between teachers' and technology coaches' perceptions of their students' digital citizenship practices, after controlling for the number of years teaching?
6. What digital citizenship topics do educators wish to teach their students?

Research Methods

Participants

Participants were recruited from graduate education programs from a southeastern university in the United States. These participants were in-service educators pursuing a graduate degree. One-hundred and seven educators responded to this online survey in Fall 2018. Eighty (86%) of the respondents were teachers and 27 (14%) participants were technology coaches. Technology coaches are teachers who provide support and resources to teachers on technology integration. In some states, technology coaches earn additional certification to be a facilitator for

technology integration (NCDPI, 2012). Eighty-five percent of the respondents were female. The participants were from elementary school (30%), middle school (30%), and high school (19%). The rest of the participants did not state their grade levels.

Survey

The survey included three parts: demographic items, digital citizenship items, and an open-ended question. The participants were asked to provide various demographic measures, such as gender, grade level, years of experience, teacher roles (teacher, technology coaches), digital citizenship teaching experience, and what devices students used in school. In all digital citizenship questions, a 5-point Likert scale was used, where “not very well” as “1;” “not well” as “2;” “somewhat” as “3;” “well” as “4;” and “very well” as “5.” At the end of the survey, an open-ended question asked the teachers what they wished to learn about digital citizenship to help their students to protect themselves online.

The digital citizenship survey consisted of five sections, including cyberbullying, digital footprint, digital privacy, digital netiquette, and digital identity.

- Cyberbullying questions assessed educators’ perception of their students' knowledge about cyberbullying. For example, whether students know the importance of having proof when a student tells them that he/she has been cyberbullied.
- Digital netiquette questions examined educators’ perceptions of students’ online behaviors when communicating online, such as how well they think their students know that posting or saying something online could be seen as rude, mean, or unfair to others.
- Digital footprint items asked respondents about their students’ knowledge of the data trail that they create.

- Digital privacy questions assessed educators' understanding of their students' knowledge about digital privacy.
- Digital identity items examined educators' perceptions of their students' knowledge about digital identity, such as that how well they think that their students know that a person's online identity can be different from their face-to-face identity.

Informed consent was obtained from the respondents who completed the survey. The reliability of the digital citizenship instrument measured through Cronbach's alpha is .94. Cronbach's alpha values of cyberbullying, digital netiquette, digital footprint, digital privacy, digital identity items are .82, .83, .90, .93 and .93, respectively. All the reliability coefficients are above the acceptable value of .70 (Nunnally, 1978).

Data Analytical Procedures

Demographic items and educators' perception of their students' digital citizenship items were summarized using descriptive statistics. A one-way analysis of variance (ANOVA) was used to examine the association between educators' perceptions of their students' digital citizenship and school level. A one-way analysis of covariance (ANCOVA) was used to determine if the educators' perceptions of their students' digital citizenship practices change based on the experience of teaching digital citizenship, while controlling for teaching experience in years. Before running the inferential statistical tests, data were screened and all assumptions examined. No outliers were detected and all assumptions (i.e., normality, homogeneity of variance, and independence) were tenable. The open-ended survey question was examined using thematic analysis. The responses were coded and categorized based on the similarities. The frequency of codes was computed for each category (Table 4).

Results

The purpose of this study is to examine teachers' perceptions of students' digital citizenship practices. In the section below, we present results based on the research questions. We provide descriptive data to answer questions 1 and 2, and inferential statistics, ANOVA and ANCOVA to answer questions 3, 4 and 5 and qualitative thematic analysis to answer question 6.

RQ1. Based on educators' perception, what digital devices do K-12 students use at school?

Table 2 presents digital devices used by K-12 students according to educators' perception. Educators stated that laptops are the most common device in schools as (71%), followed by tablets which 45% students use. While 36% of students used desktops in school, smartphone (23%) is the least common technologic device used by students.

[Insert Table 2 Here]

RQ2. Educators' perception of students' digital citizenship practices

This section summarizes educators' perceptions of students' digital citizenship practices. Means and standard deviations of the items and domains (cyberbullying, digital netiquette, digital footprint, digital privacy, and digital identity) are presented in Table 3. The means of all the items (Digital citizenship) is 2.34, and the standard deviation is .70. Cyberbullying has the highest mean at 2.51. For example, educators were asked about the importance of having proof regarding cyberbullying (M = 2.78, SD = 1.14), and what proof to collect when a student is cyberbullied (M = 2.26, SD = 1.09). On the other hand, digital identity has the lowest mean score (M = 2.11, SD = 0.87), it means educators claim that their students have more to learn regarding digital identity. The mean of some items were below 2 (How well do you think your students know that they are legally responsible for their posts online? (M=1.96, SD=1.10; How well do you think your students know that what others post, share, or reshare about them adds to their digital footprint? (M=1.94, SD=0.97; How well do you think your students are familiar with the

term “digital identity”? (M=1.94, SD=0.91). Overall, educators' perceptions of students' digital citizenship practices were more towards "not well" since the Likert scale was from 1 to 5 as 2 being “not well."

[Insert Table 3 Here]

RQ3. Do educators’ perceptions of their students’ digital citizenship practices vary between school levels?

In the survey, educators were asked to enter the grade in which they teach. The grades were categorized into elementary (K-5), middle (6-8), and high school (9-12) to create a school-level variable. It was hypothesized that no significant difference exists between different school levels in educators’ perceptions of their students’ digital citizenship practices. The means and standard deviations for educators' perceptions of students' digital citizenship results are presented in Table 4. One-way ANOVA reveals that there was not a statistically significant difference in the educators’ perception of students’ digital citizenship practices among school levels, $F(2,81)=.34$, $p=.72$, partial $\eta^2=.01$.

[Insert Table 4 Here]

A series of ANOVA’s were conducted to examine the school level difference in educators’ perceptions about students’ cyberbullying, digital footprint, digital privacy, digital netiquette, and digital identity. One-way ANOVA results reveal that there were no statistically significant differences in the educators’ perception of students’ cyberbullying ($p = .71$), digital footprint ($p = .99$), digital privacy ($p=.94$), digital netiquette ($p=.94$), and digital identity ($p= .052$) among school levels. The results of the analysis demonstrated that there was not any significant difference in educators’ perceptions of students’ digital citizenship practices as in cyberbullying,

digital footprint, digital privacy, digital netiquette, and digital identity between the three school levels.

RQ4. Do educators' perceptions of students' digital citizenship practices differ based on their experience teaching digital citizenship, with the control of the years of their teaching?

A one-way ANCOVA was performed on educators' perceptions of students' digital citizenship as a function of teaching digital citizenship, adjusting for teaching experiences. The results revealed that educators' perceptions of students' digital citizenship practices was not associated with their' teaching experiences $B = .006$, $F(1, 90) = .75$, $p = .39$, partial $\eta^2 = .01$. However, educators who taught digital citizenship reported higher perception of their students' digital citizenship practices after adjustment of teaching experience in years, $F(1, 90) = 14.96$, $p < .001$, partial $\eta^2 = .14$.

Participants' perceptions of students' cyberbullying ($p = .53$), digital footprint ($p = .36$), digital privacy ($p=.92$), digital netiquette ($p=.25$) and digital identity ($p = .81$) practices were not associated with their teaching experiences. Participants who taught digital citizenship did not report higher perception of their students' cyberbullying practices after adjustment of teaching experience, $F(1, 89) = .63$, $p = .43$, partial $\eta^2 = .007$. On the other hand, participants who taught digital citizenship reported higher perception of their students' digital footprint ($p = .001$, partial $\eta^2 = .11$ (medium effect size), digital privacy ($p = .002$, partial $\eta^2 = .10$ (medium effect size), digital netiquette ($p < .001$, partial $\eta^2 = .14$ (large effect size), and digital identity ($p= .03$, partial $\eta^2 = .05$ (small effect size) practices after adjustment of teaching experience.

RQ5. Are there any differences in educators' perceptions of their students' digital citizenship practices between teachers and technology coaches, with the control of the years of their teaching?

A one-way ANCOVA was performed on educators' perceptions of students' digital citizenship as a function of their roles as teachers and technology coaches. Participants' perceptions of students' digital citizenship practices was not associated with their' roles, $B = .009$, $F(1, 91) = 1.51$, $p = .22$, partial $\eta^2 = .02$. There was no significant difference between teachers and technology coach's perceptions about their students' digital citizenship practices after adjustment of teaching experience in years, $F(1, 91) = .94$, $p = .34$, partial $\eta^2 = .01$. There was not a significant difference between teachers and technology coaches perceptions about their students cyberbullying ($p = .93$), digital footprint ($p = .30$), digital privacy ($p = .13$), digital netiquette ($p = .23$) and digital identity ($p = .62$) after adjustment of teaching experience.

RQ6. What topics do educators wish to learn on digital citizenship to teach their students to protect themselves online?

At the end of the survey, educators were asked to share what they wish to learn to support their students to protect themselves online. The summary of responses and the frequency of occurrences of each code are presented in Table 5. Eight different themes resulted from the open-ended survey item data analysis. These themes were on, digital citizenship training, legal ramifications and real-world examples, combining digital citizenship with curriculum and teaching in a kid-friendly way, internet safety and copyright, cyberbullying, elementary grade level, digital footprint and parents' involvement.

Teachers would like to attend digital citizenship training, and a teacher said that "I would like to have various activities to create digital citizenship engaging and interactive. I also want to have different resources to share." Internet safety and copyright, cyberbullying, legal ramifications and real-world examples, and combining digital citizenship with curriculum, and digital teaching citizenship in a kid-friendly way are some commonly requested topic. Besides,

some participants mentioned parents' involvement as one of them said: "Tips to share with parents on how to talk to their children about their online presence and how as parents they can monitor their child's behaviors online." These results show that it is necessary to support teachers regarding digital citizenship so that they can assist their students to be better digital citizens.

[Insert Table 5 Here]

Discussion

In this study, educators' perceptions of their students' digital citizenship practices were examined as the use of digital technologies has been on the rise both at home and in schools. In this study, educators report that laptops are the most commonly used devices by the students in schools, and tablets are the second commonly used device in schools.

More instruction needed on digital citizenship for students

The findings from this study show that based on educators perceptions, students are aware of some of the digital citizenship topics, but there is room for more information and training. Educators ' perceptions of students' digital citizenship practices were rated mostly "not well" according to survey results. This provides guidance where instruction could be designed for the students to educate them on various digital citizenship practices. The authors further claim that digital citizenship is an evolving subject, so waiting until 8th or 9th grade or offering a one-time course may not provide a solution to digital citizenship problems.

Digital citizenship student practices do not vary across grade level

Webster (2018) examines teachers' perceptions of digital citizenship tenets some of which are digital security, digital access, digital health and wellness, digital etiquette, and digital rights and responsibilities based on the primary grade that teachers taught as 10th, 11th, and 12th grades. The researcher does not report a significant difference in teachers' perceptions of digital

citizenship tenets according to the grade levels. Similarly, this study reveals that there is no significant difference in teachers' perceptions of students' digital citizenship practices according to school levels as elementary, middle, and high schools. One reason for this result could be that students need more information and training regarding digital citizenship so that educators' perceptions did not vary among school levels.

Educators experience in teaching digital citizenship influences students' digital citizenship practices but not based on their roles

This study found that participants who taught digital citizenship had higher perceptions of their students' digital citizenship practices, digital footprint, digital privacy, digital netiquette, and digital identity after controlling years of teaching experiences. On the other hand, participants' role as technology coaches and teachers do not influence on their perceptions of students' digital citizenship practices after controlling for teaching experience. Hollandsworth et al. (2017) articulate that teachers' awareness of digital citizenship has increased more than administrators. Our findings, however, did not report any difference between teachers and technology coaches regarding their students' digital citizenship practices. Cristol and Gimbert (2018) conclude that years of work experience has a significant influence on teachers' levels of digital citizenship, which included internet usage behaviors, and individuals' skills and thinking. Our results, in contrast, indicate that teaching experience does not have a significant effect on educators' perceptions of their students' digital citizenship practices.

Digital Citizenship Topics of Interest to Educators

Open-ended questions revealed that participants would like to know more about digital citizenship training. In a prior study, the digital citizenship topics of interest to teachers are digital rights and responsibilities, digital security, and digital wellness (Xu et al., 2018). Similarly

in this study, educators desire to learn about legal ramifications, internet safety, copyright, cyberbullying, parents' involvement, and how to teach digital citizenship by considering students perspectives. In-school and out-of-school training are two vital components of digital citizenship education (Gleason & von Gillern, 2018), and there is the need for more parents' involvement in regarding of digital citizenship interventions (Hollandsworth et al., 2017). As Xu et al. (2018) state that empathy is an effective ICC skill for teachers' digital citizenship, our findings demonstrate that educators highlight the necessity of considering students' perspective during digital citizenship training.

Limitations

There were some methodological limitations in this study. First, since it was a survey-based study, the data was collected only from educators who chose to respond to the survey, and there is a response bias as all data is self-reported. Second, the sample size as relatively small. We received only 107 complete responses. Third, we examined only a few items under these five aspects of digital citizenship.

Implications and Future Research

With the increase in digital technology usage, this study highlights the need for digital citizenship education among students of all grade levels for them to demonstrate appropriate and responsible behavior online. Curriculum and lessons need to be developed and implemented on all five constructs that were examined in this study that include cyberbullying, digital footprints, digital privacy, digital netiquette, and digital identity. This study has implications for administrators, curriculum designers, publishers, teachers, technology coaches, librarians, counselors and parents of K-12 students to identify the K-12 student digital citizenship practices and to develop interventions to support them to enhance their digital citizenship practices.

Though this study focused on the digital citizenship practices of students through teacher perceptions, there is a need to examine the digital citizenship practices of teachers. Also, examining digital citizenship practices of K-12 students on these constructs based on parents' perception can potentially inform training and curriculum development for the students.

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List of Tables

Table 1. *Digital Citizenship Elements*

Digital Citizenship Elements	**Description**
Cyberbullying	Cyberbullying is bullying that takes place over digital devices like cell phones, computers, and tablets.

Digital Footprint	A digital footprint is a trail of data one creates while using the Internet.
Digital Privacy	Digital Privacy refers to the privacy of the digital information shared.
Digital Netiquette	Digital netiquette is formal or informal rules that apply when communicating online.
Digital Identity	Digital Identity refers to how one perceives oneself and how others perceive the person based on the person's online activity.

Table 2. *Digital Devices used by K-12 students at the school*

Devices	Frequency	Percentage
Laptop	76	71
Tablet	48	45
Desktop	38	36
Smartphone	25	23
Other	19	18

Table 3. *Teacher perception of students' digital citizenship practices*.

Items		M	SD
	Cyberbullying		
1	Do your students know that it is important to have proof when a student tells you that he/she has been cyberbullied?	2.78	1.14
2	Do your students know what proof to collect when they are cyberbullied?	2.26	1.09
	Total	**2.51**	**1.02**
	Digital Netiquette		
1	How well do you think your students know that posting or saying something online could be seen as rude, mean, or unfair to others of a different race or gender?	2.81	1.05
2	Do your students typically follow digital netiquette when communicating/posting online?	2.64	0.86
3	How well do you think your students know that responding to an online post in ALL CAPITAL letters is rude?	2.63	1.20
4	How well do you think your students understand that liking/sharing a mean comment/post is also mean?	2.34	1.05
5	How well do you think your students know they need the permission of the person before putting the person's photo online?	2.00	0.99
	Total	**2.49**	**0.81**
	Digital Footprint		
1	How well do you think your students are familiar with the term "digital footprint"?	2.38	1.22
2	How well do you think your students know that they cannot completely delete their online posts?	2.32	1.18
3	How well do you think your students know that they are legally responsible for their posts online?	1.96	1.10

4	How well do you think your students know that what others post, share, or reshare about them adds to their digital footprint?	1.94	0.97
	Total	**2.16**	**1.00**
	Digital Privacy		
1	How well do you think your students know not to add a stranger as a friend online?	2.62	1.18
2	How well do you think your students know not to share their passwords with a friend?	2.44	1.18
3	How well do you think your students know how to protect their passwords for online accounts?	2.39	1.06
4	How well do you think your students know not to follow a stranger online?	2.39	1.16
5	How well do you think your students know not to allow a stranger to follow them online?	2.39	1.14
6	How well do you think your students know how to create a password for their online account that is difficult for others to guess?	2.37	1.08
7	How well do you think your students know not to click on a link from a stranger's email?	2.36	1.12
8	How well do you think your students know how to edit their security setting for online accounts?	2.18	1.02
	Total	**2.39**	**0.91**
	Digital Identity		
1	How well do you think that your students know that a person's digital identity can be different from their face-to-face identity?	2.23	0.99
2	How well do you think that your students know that what they post, share, or reshare online can impact their digital identity?	2.15	0.98
3	How well do you think that your students know that their online activities can also impact their face-to-face identity?	2.10	0.90
4	How well do you think your students are familiar with the term "digital identity"?	1.94	0.91
	Total	**2.11**	**0.87**

Table 4. *Descriptive Statistics of Teachers' Perceptions of Students' Digital Citizenship*

School Level	N	*M*	*SD*
Elementary School	32	2.32	0.80
Middle School	32	2.47	0.67
High School	20	2.41	0.64
Total	84	2.40	0.71

Table 5. *Teachers' Needs of Digital Citizenship*

Codes	Frequency	Sample Quotes
Digital citizenship training	13	*I would like to gain ideas, activities, and information to make my students more informed in regards to the use and management of digital devices as well as responsible members of the digital world*

Legal ramifications and real-world examples	12	*Finally, I would like to have a better legal knowledge of cyber laws that relate to social media use and students* *Examples of students who fell into a trap. Examples of snapchats, Instagram posts, and texts messages that are considered bullying.* *Information about how images are viewed no matter what the intent is.*
Combining digital citizenship with curriculum and teaching in a kid-friendly way	12	*How whole schools can implement DC learning/curriculum into the students day.* *It would be very informative for teachers to participate in the workshop from the perspective of a student. I think many times teachers design instruction without taking into account students.*
Internet safety and copyright	11	*details about how to be safe on the specific apps my students are using, like SnapChat and WhatsApp* *What are their options when postings have been made without their permission?*
Cyberbullying	10	*What needs to be collected? What is the definition or real cyberbullying?*
Elementary grade level	6	*I set of lessons and materials to help explain these concepts at an elementary level.*
Digital footprint	5	*The best way to make digital identity and digital footprint real for students. Most just don't care or get it.* *Ways to simulate ones digital footprint easily if they exist in a way that gives a real example. Strict settings walkthrough for students.*
Parents involvement	3	*How to effectively get parents involved with their child's online activities and the importance of knowing when and where and who their child is "connected" to*