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A Literature Review-Digital Citizenship and Elementary Education

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A Literature Review: Digital Citizenship and the Elementary Educator

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Article Info	Abstract
	This literature review was conducted as part of a dissertation research study. The review examines what scholars have studied in relationship to educators' implementation of technology and instructional practices relating to digital citizenship. Additionally, the review examines the knowledge and beliefs of educators to include pre-service and current service teachers and students in K-12 education. Often research, as well as educational institutes, have emphasized the negative aspects of technology or the misuse of technology by users. Alternatively, this review highlighted the knowledge, beliefs, and professional practices of educators in order to ascertain what gaps exist to understand what needs to be addressed in promoting digital citizenship instruction in preparing students to use technology appropriately, responsibly, and ethically.

Introduction

Over the past twenty years, the world has seen an increase use of technology for educational and personal uses. Technology has become a vital part of how we, as humans, conduct business, interact with one another, and educate ourselves. Educational institutes, school districts, and business have developed Acceptable Use Policies (AUP) to protect themselves and their members against the negative issues that arise from misuse of internet and technology by its users. However, instead of focusing on the negative, digital citizenship, defined as the acceptable, ethical, and responsible use of technology, emphasizes a more collaborative, creative, and self-empowering use of technology in education (Dotter, Hedges, & Parker, 2016) as well as in personal use. The review of literature can provide opportunity to reflect upon scholarly research relating to digital citizenship instruction of students in both the K-12 and higher educational settings as well as the instructional practices related to digital citizenship implementation among the educators of students all levels of education.

Literature Review

As human beings, the development and transformation of technology has impacted many aspects of everyday life, shaping people's lives as they learn to work with and through a growing dependence and need for technology (Gazi, 2016). Technology development has impacted education as well as industry and commerce, where students will eventually participate (Karal & Bakir, 2016). Educational institutions are key elements in ensuring students receive the necessary skills to participate appropriately and efficiently as citizens in the globalization of today and tomorrow's world (Engin & Sarsar, 2015; Gazi, 2016; Karal & Bakir, 2016). Scholars such as Ribble (2015) and Mossberger, Tolbert, and McNeal (2008) viewed citizenship connected to Internet and technology use as norms, appropriate behavior, and participation in an online society, otherwise termed digital citizenship (Choi, 2016). Digital citizenship, as defined by Ribble, Bailey, and Ross (2004) is the ethical, social, and cultural awareness of issues related to technology use. This also includes acceptable norms and implications of actively using technology (Ribble et al., 2004). According to Hobbs and Jensen (2009), digital citizenship is

> the skills and knowledge needed to be effective in the increasingly social media environment, where the distinction between producer and consumer have evaporated and the blurring between public and private worlds create new ethical challenges and opportunities for children, young people, and adults. (p. 5)

Gazi (2016), Ohler (201l), Ribble and Bailey (2007), Ribble (2011, 2015, 2017), and Ribble and Miller's (2013) definitions for digital citizenship encompass having acceptable online behavior, norms or codes of online actions, and responsible technology use. According to the white paper, "Digital Citizenship: A Holistic Primer," coauthored by Impero Software and the directors of the Digital Citizenship Institute, Curran, Ribble, and Ohler, "Digital citizenship reflects our quest to help students, as well as ourselves, develop the skills and perspectives necessary to live a digital lifestyle that is safe, ethical, and responsible, as well as inspired, innovative and involved" (Impero Software & Digital Citizenship Institute, 2016, p. 2). The authors' intention in publishing this document was to "help schools understand and effectively teach digital citizenship" (p. 1).

Digital citizenship is neither a trend in technology development nor a label for online-behavior guidelines but instead is a matter of real issues impacting technology users regardless of age or status (Snyder, 2016). Nine elements highlight positive and negative online behavior (Ribble, 2011). Because Web 2.0 tools were developed with adults in mind, many interactions that occur online require a maturity level that many K–12 students, especially elementary aged, may not be ready to manage. The maturity level necessary to engage with Web 2.0 tools are forcing students to mature faster than those in previous generations (Ribble & Miller, 2013). Therefore, for the purpose of this literature review, all reference to digital citizenship will mean an individual's appropriate, ethical, and responsible use of technology for all aspects of device use, websites, open-education resources, documents, and collaborative environments such as social-networking sites. This definition grew from examining and combining the definitions provided by previously scholars. Junko and Ananou (2015) outlined the social, emotional, ethical, and cognitive impact technology has had on today's learners to understand how education can lessen adverse effects and provide a more well-rounded student. When educators emphasize digital citizenship in the educational setting, students engage in appropriate online-behavior practices (Chou, Block, & Jesness, 2012). Therefore, it is not only valuable for educators to have knowledge about digital citizenship but to also implement sound practices into their instruction with technology.

Ribble's Nine Elements of Digital Citizenship

Ribble's (2011, 2015) nine elements of digital citizenship are digital access, digital commerce, digital communication, digital literacy, digital etiquette, digital law, digital rights and responsibilities, digital health and well-being, and digital security (and safety), each defined below.

Digital Access

Digital access is the idea of having equitable access to technological resources to participate fully in society including providing accommodations for individuals with disabilities. In the classroom setting, digital access can be used to accommodate students with disabilities accessing traditional curriculum content. Choi's (2016) concept analysis found many studies attribute access to digital resources, otherwise termed the *digital divide,* as a barrier to being able to develop as a citizen with media and information-literacy skills.

Digital Commerce

Digital commerce is the ability to buy and sell goods electronically to promote a globalized market for products (Curran & Ribble, 2017; Ribble, 2015). Students need to be made aware of costs associated with buying items online such as extra coins for a game or a new application for the tablet (Curran & Ribble, 2017). Furthermore, students need to recognize how their personal information can be made vulnerable through the use of insecure websites when making online purchases (Curran & Ribble, 2017).

Digital Communication

Digital communication is the way individuals connect through digital means as well as the flow and interaction of information accessed through technology. Uzuboylu and Hürsen (2011) recognized when people are lifelong learners, they change their behavior as a result of experiences impacting their personal and professional lives. Being a lifelong learner means developing competencies such as information retrieval or learning how to communicate in an intelligent, appropriate, and efficient manner using technology such as email and cell phones (Ozdamli & Ozdal, 2015). It may be more valuable to focus on the intended message before picking a tool to

deliver it through text, email, and social media applications such as SnapChat and Twitter, or face-to-face (Curran & Ribble, 2017).

Digital Literacy

Sometimes referenced as new literacies, media literacies, or information literacies, digital literacy is essentially an individual's basic understanding of computer functions and technology use by being able to apply digital skills to specific situations to engage in the online world (Curran & Ribble, 2017). Teachers who provide opportunities for students to develop quality digital-literacy skills such as navigating and evaluating online platforms and comprehending the building blocks of computer and device use such as email, search engines, word processing, and producing are preparing students to be better 21st-century workers (Curran & Ribble, 2017). New literacy skills are necessary for digital citizenship (Simsek & Simsek, 2013). Access to reliable and creditable information has increased with the development of new literacies; there by enhancing one's ability to "share, compare, and contextualize information by developing new skills" (Simsek & Simsek, 2013, p. 133). Online collaboration and communication skills improve users' self-efficacy with technology use as users become more confident using the Internet to access and evaluate information, as well as cooperate, collaborate, and communicate with others through the web (Aesaert, Van Nijlen, Vanderlinde, & van Braak, 2014; Choi, Glassmen, & Cristol, 2017; Livingstone & Helsper, 2009; Moeller, Joseph, Lau, & Carbo, 2011; Simsek & Simsek, 2013).

Digital Etiquette

Digital etiquette is sometimes referred to as 'netiquette,' indicating accepted standards for behaving in digital forums. Netiquette indicates online morality and ethics (Park, Na, & Kim, 2014). Cyberspace has its own code of behaviors separate from the real world that support users in determining what is acceptable and not acceptable to do when engaging in activities online (Park et al., 2014). Digital etiquette also relates to organizations needing to have AUPs and individuals understanding of when it is appropriate to use certain technologies and devices in their personal and professional lives (Ribble, 2015). Additionally, etiquette is about humanizing the interactions people have with one another by remembering it is not a machine but a person on receiving opposite end of tweets, texts, and emails (Curran & Ribble, 2017). Teachers support students in developing this element by having them learn how to communicate in different messaging situations and with various people, including the use of positive or constructive communication versus negative, aggressive, or poorly articulated communication (Curran & Ribble, 2017).

Digital Law

Digital law is about the understanding of what actions are considered poor behavior and what actions break actual laws, aligning significantly with issues related to intellectual property and copyright issues (Curran & Ribble, 2017). Furthermore, digital law is about developing a code of conduct for fair access, sharing, downloading, altering, or reusing material distributed digitally. Educating students in digital law includes instructing them on how to do Internet research and properly cite sources of different types of media including photographs, articles, and videos (Curran & Ribble, 2017). Laws were created to ensure individuals' rights are protected and to ensure those who behave inappropriately in digital environments are prosecuted. Inappropriate online behavior encompasses the development and sharing of computer viruses or hacking protocols, plagiarizing and distributing publications by other people while claiming them as one's own work, sharing files that should be paid for before using, the creation and distribution of media of an unacceptable nature such as child pornography, and actively pursuing an individual and invading their life through the use of social-media outlets so as to cause them harm or fear (known as Internet stalking; Ribble, 2015). Students also need to be aware of the legal ramifications of not giving credit to sources and sharing inappropriate content through sexting or other social media (Curran & Ribble, 2017).

Digital Rights and Responsibilities

Digital rights and responsibilities are the freedoms of using the digital world while also being responsible for the use of what one accesses. When educators help students to recognize responsibilities come with using technology, they provide students with the opportunity to be positive contributors to the global world (Curran &

Ribble, 2017). Additionally, parents play a significant role in supporting rights and responsibilities by monitoring their child's online accounts and activities (Curran & Ribble, 2017) and by being an example in their use of social media.

Digital Health and Well-being

Digital health and well-being are an individual's ability to maintain physical and mental health while still engaging in the digital world, including the recognition and acknowledgment that one can overuse technology compared to the ability to find balance between online and real-world lives. This element's negative aspect is based on the amount of time individuals spend looking at screens and not physically moving (Curran & Ribble, 2017). Of adults, 65% use social media regularly (Pew Research Center, 2015). With the high usage of online platforms for entertainment and interaction, it is valuable to model to students how to build healthy relationships with people through digital communication and face-to-face interactions (Curran & Ribble, 2017).

Digital Security (and Safety)

Digital security is about the protocols, policies, and procedures individuals use to ensure their use of the Internet does not have a negative impact on other aspects of their lives. This element emphasizes the precautions individuals must take to ensure private information is not compromised or stolen as a result of electronic interactions. People practicing good digital safety and security have habits and practices like purchasing and installing virus protection on their computers, creating backup systems for valuable documentation through external hard drives or cloud storage, and only using sites with clear safety protocols when sharing sensitive and personal information (Ribble, 2015). Knowledge and experience specific to computer security are essential for teachers to understand and pass on specific behaviors (Jagasia, Baul, & Mallik, 2015). Through the use of Ribble's (2015) nine elements of digital citizenship, educators, students, parents, and policymakers are able to develop an understanding of ethical, appropriate, and responsible uses of technology. Stakeholders can also discern what are unacceptable, poor, or illegal uses of technology in the confines of educational settings and in the broader, more open, interconnected and globalized world. The nine elements provide a framework to address issues by focusing on specific aspects of technology use and integration. These elements should be taught continuously throughout a student's education to ensure developmentally appropriate topics are covered at crucial times in students' use of technology (Ribble, 2015). Additionally, students should be repeatedly exposed to the elements to reinforce appropriate, ethical, and responsible technology-use behavior over time (Ribble, 2017).

Issues of Poor Technology Use

Issues of poor technology use will arise when individuals are not trained on specific laws and policies in place for responsibly and ethically using technology. Many dangers exist through Internet access (Shillair et al., 2015); individuals should learn safe online behaviors at younger ages than ever before. Elementary-aged students are particularly susceptible to technology misuse because they are at the beginning stages of digital literacy and understanding of appropriate behaviors for interacting with others in real-world interactions and online interactions. Examples of how people misuse technology are provided in the following section. In 2011, the Pew Research Center released a report entitled "Teens, Kindness, and Cruelty on Social Network Sites," indicating at least a quarter of survey respondents had their interactions online impact their life significantly (Lenhart, Madden, Smith, Purcell, & Zickuhr, 2011). The real-life impact resulted in the form of face-to-face arguments following online communication, friendship loss, or feeling uncomfortable attending school after online situations (Ribble & Miller, 2013). Statistics such as these indicate responsible and appropriate technology use needs to be addressed at the school level (Ribble & Miller, 2013). Student access to technology is not limited to devices provided at school; however, the misuse of social media and technology impacts the social environment of the school, increasing bullying because the physical constraints of face-to-face interactions or because school hours are no longer a factor (Ribble & Miller, 2013). To address this issue, some states across the United States are beginning to develop laws that allow school leaders to suspend or expel individuals engaging in cyberbullying or sexual harassment and the distribution of naked photographs and videos using technology (known as sexting; Ribble & Miller, 2013). Students proficiency in technology-literacy skills accompanies a growing rise in cyber-related crimes. News reports and social media continue to document examples of poor technology use and overall poor social judgment (Ribble, 2015). Students may inadvertently

engage in online interactions that are harmful to themselves or others as a result of lack of knowledge (Snyder, 2016).

Policy and Laws for Responsible Technology Use

School disciplinary policies for technology misuse fall into one of two categories: issues handled case-by-case or firewalls and blockades preventing students from accessing parts of the Internet (Ohler, 2011). Additionally, educators have concerns regarding other important issues such as learning to use the Internet and technology in a responsible way and are not addressing the discerning of appropriate and inappropriate content (Ohler, 2011). Currently, two significant federal laws exist to enforce the teaching of Internet ethics, safety, and security: the Children's Internet Protection Act of 2001 (updated 2011) and the Broadband Data Improvement Act of 2008 (Pusey & Sadera, 2012). These laws address K–12 schools' requirement to have policy related to acceptable online content access and the instruction of acceptable online behavior. The laws are vague and not strictly enforced (Pusey & Sadera, 2012). In 2008, Pruitt-Mentle and the Stay Safe Online Organization conducted the first National Cyberethics, Cybersafety and Cybersecurity Baseline Study to discern how U.S. schools addressed cybersecurity, cybersafety, and cyberethics. Research results revealed schools address Internet ethics, safety, and security by only focusing on issues related to plagiarism and cyberbullying (Pusey & Sadera, 2012). More current literature reflects the continued focus on understanding and addressing issues of cyberbullying (Jones & Mitchell, 2015; Steinmetz, 2013; Styron, Bonner, Styron, Bridgeforth, & Martin, 2015).

Digital Ethics Behavior of Students

Pardo and Siemens (2014) described ethics as being left to the interpretation of an organization's stakeholders' views of what is acceptable and unacceptable online behavior. Several researchers studied unethical online behaviors of students. James, Davis, Flores, Francis, Pettingill, Rundle, and Gardner (2010) conducted a 3-year empirical research study called the GoodPlay project, which documented and analyzed the online behaviors of youth to identify the digital knowledge and ethics they possess. James et al. collected data through interviews, analysis of theoretical standpoints on culture, psychology, and sociology, and identified research trends on developing new media usage. The researchers identified five topics that represent areas of poor technology use or ethical dilemmas. These topics include "identity, privacy, ownership and authorship, credibility, and participation" (Davis, Katz, Santo, & James, 2010, p. 126; James et al., 2010, p. 269).

Identity is the understanding of how individuals represent themselves in online environments including what information they share. Shared information may be too revealing or deceptive and misleading (Davis et al., 2010). Privacy issues align with what personal information one shares or what individuals share about others, such as posting and tagging photographs of someone in a questionable or unflattering situation. Ownership and authorship issues arise with the collaborative and often open resourcing of many Web 2.0 technologies. Credibility relates to building and giving trust (Davis et al., 2010), such as reading reviews of places or products to determine the authenticity of what is being marketed online. Last, participation aligns with individuals' sense of right and responsibility when interacting in online, collaborative, and social-interactive environments (Davis et al., 2010). Researchers acknowledged additional research needs to be conducted to understand what youth believe to impact their choices when making ethical online decisions and what supports are necessary to meet their needs. Researchers proposed the creation of a curriculum to support youth in developing the skills necessary to make good choices online, but additional research will be needed to determine effective objectives and activities.

In continuation and in partnership with Common Sense Media, the GoodPlay Project, and Global Kids, researchers Davis et al. (2010) qualitatively analyzed electronic dialogues from a 3-week series of online discussions by more than 150 teachers, adolescents, and parents. Results revealed adults were more likely to engage in ethical and morally responsible thinking compared to adolescents. Additionally, adolescents disclosed they engaged in unethical online behaviors such as downloading and stealing others' intellectual property with indifference toward their actions. Implications of this study are the significant role adults, teachers, and parents play in modeling for children and adolescents about how to be a good digital citizen. The researchers recommended using support groups and intervention programs that encourage adults, specifically parents, to dialogue with children about moral and ethical online behavior (Davis et al., 2010).

Furthermore, Konrath, O'Brien, and Hsing (2011) conducted a cross-temporal meta-analysis study tracking the empathy of college students over a 30-year period, 1979–2009. The researchers conducted a literature search in

the Web of Knowledge database for studies that used the Interpersonal Reactivity Index (IRI) to study empathy among U.S. college students at traditional 4-year undergraduate institutions; a total of 72 studies met the criteria for this meta-analysis (Konrath et al., 2011). Researchers analyzed the IRI subscales of each of the 72 qualifying studies through correlation of the year the study was conducted and mean scores on the IRI. Regression analysis revealed mean scores for studies conducted in the same year. Results of scores from the IRI revealed, under the empathy subscale, a 48% drop in empathetic concern and a 34% drop in perspective taking (Konrath et al., 2011). These results, along with other research into empathy, are believed to contribute to the lack of physical interaction and increased access to more violent content online such as videos and gaming, resulting in the dehumanization of people (Konrath as cited by Swanbrow, 2010; Ribble & Miller, 2013). Intervention programs have been introduced to support teaching empathy to children and adolescents, such as a program called Roots of Empathy (Konrath et al., 2011); however, the program does not specifically state these programs are the answer. Instead they recommend schools and families continue to introduce interventions to counteract some of the negative behavior from overuse of technology, such as just having 20 to 30 minutes of face-to-face contact with other people, free of technology use (Konrath et al., 2011).

Poor online behavior, such as cyberbullying or harassment, may be an individual's way of escalating their popularity or seeking validation by making others feel weaker or victimized (Farmer, 2011). When students do not receive education about how to interact with others, online or in person, they lack the capacity to relate to others, especially those with differing ideas, cultures, or belief systems, and they do not develop a moral or ethical code based on respect and understanding (Snyder, 2016). Therefore, unguided technology use may result in a lowered moral compass and a higher rate of negative interactions between humans.

Teachers and students, regardless of their educational level, can be taught to use various technologies, but should have a foundation for responsible and ethical technology use to prevent them from developing poor lifelong habits and the potential for causing harm to others (Wilson, Scalise, & Gochyyev, 2014). An understanding of what is acceptable and what is unacceptable when using technology needs to be established in the learning environment and at home. Thus, when time is given to address potential issues of poor technology use or highlight appropriate use of technology, students will be less likely to make poor choices.

Scholars recommended that emphasis on the importance of exposure to instructional experiences will help students recognize appropriate and ethical behavior in the digital world (Davis et al., 2010; Farmer, 2011; Konrath et al., 2011; Pardo & Siemens, 2014; Ribble & Miller, 2013; Snyder, 2016; Swanbrow, 2010). Additionally, teachers can model acceptable behaviors in their own technology practices in planning and integrating digital citizenship into the curriculum. Therefore, establishing what teachers know and believe about digital citizenship or what they plan and implement in their learning environments will help determine what additional support they need to ensure teachers and students learn and use all aspects of digital citizenship.

Prior Research into Digital Citizenship Knowledge and Concepts

Limited research specifically examined the knowledge or beliefs of teachers regarding digital citizenship through the lens of Ribble's nine elements. Some researchers focused on student behavior in relationship to some aspects of digital citizenship. A few research studies focused on attempts to develop or integrate curriculum that addressed digital citizenship into learning environments, specifically middle and high school levels. Researchers conducted very minimal research at the elementary level with teachers, and virtually nothing with elementary students with respect to Ribble's nine elements or digital citizenship in general.

Although researchers regularly cited Ribble in journal articles regarding developing a concrete definition of digital citizenship, many citations are used to provide a rationale for why digital citizenship will prepare students for the future, supporting technology-infused curriculum, and how digital citizenship could help prepare teachers and administrators for potential hazards that can arise with technology use that is not covered by organizational acceptable-use policies. Studies cited below either directly referenced Ribble's nine elements as the framework for the research design or used the nine elements as a key definition related to the research question(s). The majority of the literature focused on preservice teachers, identified as "Digital Natives." Based on Prensky's (2001) definition, a digital native is someone who has never known a time without the Internet. However, scholars debate the exact point in time when "natives" were first born.

Several dissertation studies incorporated Ribble's nine elements as either a reference to define specific aspects of digital citizenship or as a conceptual framework Such dissertations include the works of Baumann (2016), Boyle (2010), Klinger (2016), Lindsey (2015), Lyons, (2012) Snyder (2016), and Suppo (2013). Of the studies

referenced, only one, Baumann, used teachers of elementary-age students as participants. Additionally, Baumann only examined one element of digital citizenship: safety and security. Boyle, Lyons, and Suppo conducted quantitative studies whereas Baumann, Klinger, and Lindsey used qualitative research strategies. A comparison of scholarly literature from dissertation and other research follows.

Preservice Teacher Training

Sincar (2011, 2013), Pusey and Sadera (2012), Lindsey (2015), Karal and Bakir (2016), and Çiftci and Aladag (2018) conducted research studies on preservice teachers' knowledge of digital citizenship. Sincar (2011) and Karal and Bakir conducted qualitative studies, Lindsey and Sincar (2013) conducted mixed-methods studies, and Pusey and Sadera and Çiftci and Aladag conducted a quantitative survey study. Additionally, Pusey and Sadera emphasized the curriculum of cyber ethics, cyber security, and cyber safety (C3) rather than Ribble's nine elements of digital citizenship as the framework to determine digital citizenship knowledge. Sincar (2011) conducted a qualitative study of 17 preservice teachers' recognition of Ribble's nine elements. Then, Sincar adapted the study into a mixed-methods study also using preservice teachers to consider the influence of gender on digital citizenship habits. Sincar used semistructured interviews lasting 30–60 minutes with open-ended questions and inductive analysis to identify themes and patterns. The results of the study indicated participants possessed adequate behaviors for digital literacy and digital communication but lacked proficiency in the other seven elements.

In 2013, Sincar used a quantitative form to identify gender and social-media usage (type and duration per day) among 210 preservice teachers and semistructured interviews with the participants that emphasized five basic questions and five open-ended questions on causes for inappropriate technology and device usage. Sincar used multiple linear regression for the quantitative portion and deductive analysis of themes and patterns for the qualitative portion. Results revealed more male than female preservice teachers engaged in inappropriate behaviors in technology use; however, women were not entirely free of poor behavior. Sincar's studies in connection with Ribble's nine elements concluded preservice teachers were not prepared to exemplify good digital citizenship for their future students. Greater emphasis should be placed on the ethical and responsible use of technology for personal and curriculum instructional purposes in college-preparation programs (Sincar, 2013). Additionally, this lack of preparation among preservice teachers could indicate the need for professional development for current teachers focused on the nine elements of digital citizenship (Snyder, 2016).

Like Sincar (2013), Lindsey (2015) used a mixed-methods study but used action research focused on a training program at the university level. Participants were faculty working in the College of Education and teacher-candidate students. Through this study, researchers aimed to determine if a technology-support system that used appropriate digital citizenship behavior would affect participants' plans for future classroom instruction. Data was collected using surveys, focus-group interviews of teacher candidates, interviews with course instructors, researcher journal reflections, and field-note observations. Lindsey analyzed data using an ANOVA for the quantitative portion and a constant-comparative method to identify themes from open codes for the qualitative portion. Participants felt the intervention had a positive impact on their professional practice and intended to implement learned strategies into their future instruction (Lindsey, 2015).

Karal and Bakir (2016) conducted a qualitative case study involving preservice teachers. Data-collection methods involved observations and interviews of 11 preservice teachers over a period of 5 weeks while they completed their required classroom-teaching practicum. The authors identified all participants as digital natives, aligned with Prensky's (2001) definition, aiming to measure the perceptions of digital citizenship terms by preservice teachers. Results from Karal and Bakir revealed preservice teachers closely associated digital citizenship terms and Ribble's nine elements of digital citizenship with clear but simple definitions of each element. However, preservice teachers only emphasized being put on digital communication, digital access, and digital literacy in the classroom environment (Karal & Bakir, 2016). Implications of the Karal and Bakir study align with the research findings of Sincar (2011, 2013) and Lindsey (2015), in which exposure to digital citizenship curriculum at the university level supports preservice teachers' preparation to use these practices in their future classrooms.

Pusey and Sadera (2012) conducted a survey study of 318 university students majoring in education, often referenced as preservice teachers, and their knowledge of and preparedness to teach C3 curriculum. Like the previously mentioned studies, the researchers identified study participants as digital natives because they have never known a time when the Internet did not exist. The researchers hypothesized that despite the population's exposure to the web and mobile devices over their lifetime, they might not possess the skills necessary to

include C3 curriculum in their future instructional methods. Data accrued using a face-to-face administration of a quantitative survey—the *C3 Awareness and Instructional Preparedness Instrument*—to identify what preservice teachers knew about C3 curriculum and what topics they were prepared to teach in their future classrooms over a period of several semesters from 2008 to 2010 (Pusey & Sadera, 2012).

Pusey and Sadera (2012) used descriptive statistics of means of the topics of awareness and preparedness to determine a threshold for which an individual was prepared or unprepared to teach specific topics The results of the study revealed that a majority of participants were knowledgeable and felt prepared to teach four skills typically associated with digital literacy or digital communication: emailing with attachments, text messaging, cell-phone usage, and plagiarism. Other components related to a C3 curriculum more closely connected to digital elements such as digital law, digital rights and responsibilities, and digital security and safety, revealing low knowledge or preparedness for instructing students including topics such as disposal of technology, phishing, tracking cookies, and fair-use exceptions (Pusey & Sadera, 2012). Implications of this study revealed that although preservice teachers may have a lifetime of working with technology, they do not have knowledge or skills necessary to instruct future generations on issues of poor digital citizenship (Pusey & Sadera, 2012). In alignment with the findings of Karal and Bakir (2016), Lindsey (2015), and Sincar (2011, 2013), the researchers recommended that university education programs develop their curriculum to better address knowledge competencies for digital citizenship to ensure teachers are ready to provide this type of curriculum. Çiftci and Aladag (2018) conducted a descriptive survey study of elementary-level preservice teachers using two instruments: the Digital Citizenship Scale developed by Isman and Canan Gungoren (2014) and the Attitude Scale for Digital Technology developed by Cabi (2016). Study results showed no connection between gender and attitudes toward technology digital citizenship. However, a significant difference emerged between the level of digital citizenship and Internet access (connection), but no significance in attitude and Internet access. The results also showed a significant difference in attitudes on technology and citizenship when considering years of experience using the Internet. Additionally, participants' years in the program) impacted the attitudes and citizenship scale. The implications of the study revealed that with more experience in Internet use, participants had a more positive attitude toward technology and an increased level of digital citizenship. These results are significant when considering future classrooms filled with digital natives because if educators who are responsible for their instruction have a positive attitude toward technology use, they are likely to support students in positively developing as digital citizens.

Teacher Practices for Digital Citizenship

Baumann (2016) conducted a qualitative case study using surveys, interviews, and artifact analysis with 20 administrators and teachers from public schools in Connecticut. Baumann aimed to examine the perceptions of K–5 faculty in addressing computer safety and security in the curriculum. The administration did not recognize the need for additional instructional time to address computer safety and security. In contrast, teachers who were attempting to implement this concept into their instructional practices believed they lacked proper training. Researcher recommendations included up-to-date and ongoing training on relevant topics for computer-safety issues and instruction, professional development for computer use and integration, adoption of a new curriculum that emphasizes common core and 21st-century skills for technology use, and a need for administrators to reconsider policies to address and enforce consequences for inappropriate technology use. Additionally, Baumann recommended that further research address the effectiveness of AUP and enforcement of policies for student computer safety and security. Similar to Baumann's (2016) study, Klinger's (2016) qualitative case study used teachers; however, Klinger used 12 private-school teachers from Grades 6–12 classrooms inquiring into the digital communication tool use for social collaborative and learning usage among students. Klinger interviewed participants using a semistructured, face-to-face, individual interview. Klinger recorded the interviews and coded them to identify themes. Participants revealed that although they believed their students possessed the necessary digital-literacy skills to use the tools, they did not possess the appropriate maturity level to engage successfully through the use of the tools. Implications of this study are that technology-device choice and training to support the mature and responsible use of collaborative social learning through a digital citizenship curriculum would better support this type of learning experience. Information about studies focusing specifically on student behavior follows.

K–12 Students and Digital Citizenship

Placing emphasis on student behavior instead of teacher action, Boyle (2010) and Lyons (2012) conducted quantitative studies and Davis and James (2013) conducted a qualitative study. Boyle used high school aged

students (approximately 14–18 years old in Grades 9–12), Davis and James (2013) used preadolescents (11–13 year olds, approximately Grades 6–8), and Lyons used a span of students from fifth through 11th grade, crossing from preadolescents to adolescents. Boyle (2010) used a quasiexperimental quantitative study to determine if high school students exposed to a digital citizenship curriculum would adopt digital citizenship behavioral elements into their technology-use practices. The researcher collected data from 150 high school student participants using a pre and posttest of Ribble and Bailey's (2007) Digital Driver's License instrument. Student participants were in two different curriculum paths or academies: the Academy of Arts and the Academy of Technology.

Half of the participants were exposed to a series of lessons on digital citizenship—the experimental group—and the other half were not: the control group. Boyle (2010) included students from both academies in the experimental and control groups. Both groups attended schoolwide oral presentations on digital citizenship behavior that was part of the regular school programming. Boyle analyzed data using a *t*-test to compare each individual group's pre- and posttest scores and conducted an ANCOVA between groups' posttests, using pretests as the covariant. Boyle (2010) found that, with exposure to a digital citizenship curriculum, students exhibited strong digital citizenship behaviors in all elements except digital access and digital security. Although these two elements did not have a significant impact on the students' technology use behavior, they did not have adverse consequences either. Boyle rationalized that the lack of impact on security and access may have resulted from the age of the students and their exposure to technology access throughout their lives. Additionally, Boyle proposed that the schools may have spent more time emphasizing digital security over other elements throughout the educational experience of the participants before their participation in the study.

Boyle (2010) recommended that school leaders monitor student technology-use behaviors to determine and tailor the type of programming needed to support students with learning-appropriate online behavior. Because Boyle used students in different curriculum programs, one recommendation was to ensure all students received the same type of curriculum in digital citizenship, regardless of their curriculum path, including schools that do not offer different curriculum paths. Finally, a suggestion for further research included finding out what teachers believe to be best practices for digital citizenship instruction. The study's findings align with those of Gazi (2016), Ohler (2011), Ribble et al. (2004), and Ribble and Miller's (2013) position about the importance of exposing students to a digital citizen curriculum to develop appropriate technology use skills.

Lyons (2012) conducted a study focusing on student digital use. Using an ex post facto quantitative study of the online behaviors of fifth- through 11th-grade students in a K–12 public school district in California, Lyons compared student gender and grade level to online behavior. Specific areas of focus included cyberbullying, parent involvement, personal safety, and digital citizenship abuse, based on historical data of district and archived surveys. Lyons analyzed data using an ANOVA to determine if a causal relationship existed among gender, grade level, and misbehavior online. Research results revealed that differences existed between grade level and gender. As students aged, their parental involvement decreased but risks increased for the other three subscales. Additionally, young women had fewer issues with digital citizenship abuse and personal-safety concerns; however, the level of parental involvement stayed constant across genders. The implications of the study included the need to increase awareness of all issues among all stakeholders: parents, teachers, administrators, and students (Lyons, 2012).

Using a similar population by age to Lyons (2012), Davis and James (2013) conducted a qualitative case study in which they interviewed 42 preadolescents (middle-school-aged students approximately 11–13 years old) about their behaviors and attitudes toward maintaining their online privacy in social-media environments and the impact educators play in developing these practices. Researchers included participants from different schools who had different racial and diverse socioeconomic backgrounds. Davis and James used surveys to identify the digital aptitude of participants and invited those with the greatest digital experience and engagement to participate in interviews. Each interview participant had two one-on-one interviews each lasting about 45 minutes.

The results revealed that participants did engage in practices in which they were aware of potential dangers of sharing private information in online public settings, and they also possessed a variety of strategies to ensure others were not accessing or using their private information (Davis & James, 2013). However, teachers provided a narrower perspective of online privacy issues, focusing only on what not to do or not to post and rarely promoted positive interactions with others in online environments. Davis and James averred teachers should consider how their instruction directly and indirectly impacts what students do in their online privacy and interactions with others.

Teachers and Students Using Digital Citizenship

Focusing on teachers and students, Snyder (2016) conducted a qualitative case study of middle school students and teachers. The goal of the learning project was to provide students with technological experiences that helped them develop their understanding of digital citizenship. Students used social media to support their learning of different cultures, develop a worldlier view of other cultures, and compare their own digital footprints. Data accrued from interviews and data in the Wiki learning environment. Snyder analyzed both interactions using open coding to identify themes and patterns. Results from the case study revealed that students' knowledge increased, and they made greater effort to engage in making responsible, ethical, and appropriate choices in online collaborative environments. Additionally, teachers planned to continue to implement practices for responsible and ethical use of technology in their instruction. However, study implications were that if teachers had not participated in the study, they might not have considered incorporating digital citizenship elements into the curriculum. This study is significant to the body of knowledge because Snyder examined teachers and students working together to learn about digital citizenship and considered what teachers do professionally to integrate technology and what students learn as a result of teachers' implemented practices. Research conducted in dissertations over the past eight years, as well as scholarly studies, revealed a trend that a lack knowledge and understanding persists about what is appropriate, responsible, and ethical use of technology among students and teachers at all levels. This implication aligns with the need for further study on knowledge of digital citizenship. However, greater emphasis may need to focus on what teachers and students do know and less on what they do not know.

Rationale for Digital Citizenship, a Component of 21st Century Learning

Citizenship is a "commitment to common good, public interest, and places the interest of the community ahead of personal interest...education is seen as enhancing the public and common good" (Oyedemi, 2015, p. 453). When people actively participate in an interconnected and interdependent world, they are acknowledging the existence of global citizenship (Andrzejewski & Alessio, 1999; Choi, 2016; Martens & Hobbs, 2015). Furthermore, digital citizenship is not solely a list of behaviors for using technology, but instead is concept that impacts all students, teachers, parents, school and community leaders, and the greater world by establishing norms or codes of behavior for how individuals learn to get along in an increasingly connected world (Snyder, 2016).

Technology has played a significant role in supporting globalization, allowing individuals to become members of online communities through social networking such as Facebook, Twitter, YouTube, Instagram, and LinkedIn. In the past, being able to read, write, and do basic mathematics was a symbol of being a knowledgeable, productive, and contributing member of society; one could make intelligent decisions based on the possession of these skills (Simsek & Simsek, 2013). However, in recent years, the literacy skills that mark an acceptable member of society are not as passive as in the past; they include reading, researching, understanding, interpreting, collaborating, and sharing (Martens & Hobbs, 2015; Simsek & Simsek, 2013). Trilling and Fadel (2009) and Kivunja (2014) believed that an educated person needs to have skills for independent and efficient problem-solving and logical thinking. Furthermore, the capabilities of computers and the Internet have enhanced ethical dilemmas and raised new issues and moral choices that were nonexistent in the pre-Web 2.0 world (Mulka, 2014; Rice et al., 2015).

Ohler (2012) outlined the aspects of digital citizenship and advocated for community-based initiatives in educating children. Ohler suggested the use of curriculum programming that breaks the boundaries of the school's walls to include parents, community leaders, teachers, administrators, and students. Scholars have begun to recognize the benefit of digital etiquette in preventing perceived poor digital behavior (Baumann, 2016). Education skills for the 21st century comprise key domains that included the traditional reading, writing, and arithmetic skills as well as "learning and innovation skills," "career and life skills," and "digital literacy skills" (Kivunja, 2014, p. 85; Trilling & Fadel, 2009, pp. 175–176). These more active literacy skills change the way individuals may interact with one another and contribute to the quality of the community with information flow that is dynamic and multidirectional (Simsek & Simsek, 2013). For people to engage in particular democracy and have appropriate citizenship behaviors, they need access to credible information that comes from the ability to use specific digital-literacy skills such as research and judgment (Simsek & Simsek, 2013).

Access to Internet and mass-media sources enables the development of citizenship in young adults by allowing them to participate in political, cultural, and educational purposes (Oyedemi, 2015). In concurrence, when students are exposed to media literacy education, they are more likely to become civically involved in

community or societal issues (Martens & Hobbs, 2015). Teachers instructing across subject areas and integrating civic engagement, such as researching, producing, and publishing products that support student learning about current political and social conditions, are promoting curiosity and self-efficacy as well as developing students' moral compass (Martens & Hobbs, 2015). Technology instruction should predominantly focus on helping this generation build a sense of responsibility related to technology use at personal, local, and global levels (Ohler, 2011). Choi (2016) conducted a concept analysis of studies related to citizenship education and found a divide among scholars in studies related to citizenship and Internet use. Analysis revealed four major themes in research related to digital citizenship literature: media and information literacy, ethics, participation/engagement, and critical resistance. Choi postulated that digital citizenship is a complex concept that makes connections with interactions in the real world as well as in an online environment.

Educators have a moral obligation to prepare students to be citizens who can contribute to society productively and adapt to the changes and complexities of society (Fullan, 2001). Digital citizenship provides a backbone for teachers, school leaders, and parents to comprehend and model appropriate use of technology (Gazi, 2016). Learning that happens because of interactions between humans and technology forces individuals to consider their values (Williams, Karousou, Mackness, 2011). Because the goal of education is to prepare students for their future, it is essential that students learn to be responsible digital citizens while in their formative years, to better prepare them for their future roles working and living in an increasingly more digitally dependent society (Snyder, 2016).

Considering the impact of curriculum, van de Oudeweetering and Voogt (2018) conducted a secondary analysis of survey results from nearly 3000 K–12 teachers in the Netherlands about their perceptions of the frequency of classroom activities that promoted 21st-century learning skills. Their research focused on six specific competencies of 21st-century learning: "digital literacy, innovative thinking, critical thinking, and communication, (digital) citizenship, self-regulated learning, and (computer-supported) collaborative learning" (van de Oudeweetering & Voogt, 2018, p. 116). The analysis revealed teachers perceived themselves as spending less time on digital literacy and innovative-thinking activities compared to collaboration and self-regulated learning, inferring a result of the novelty of these types of learning activities. Therefore, digital literacy and innovative thinking have not been fully developed in the curriculum teachers are prepared to teach. The researchers recommended consideration of curriculum development, specifically in the areas of digital literacy and innovative thinking to support teachers' ability to integrate them into classroom-activities. Additionally, researchers recommended teacher and school leaders reflect on facilitating these competencies and their connection with digital citizenship.

On a related note, Hollandsworth, Dowdy, and Donovan (2011) raised questions about who is responsible for educating students on digital issues. They put out a call to action for educators to develop programs that do not solely rely on schools to support this learning but instead advocated for a community approach, including the use of students (Hollandsworth et al., 2011). In disseminating knowledge related to being a good digital citizen and protecting students from dangers of the Internet, Pruitt-Mentle (2008) identified parents as responsible for providing Internet-ethics learning and the information (or instructional) technology department as responsible for the learning and maintenance of the Internet infrastructure. In agreement, Hobbs and Jensen (2009, as cited in Davis et al., 2010) suggested that media-literacy education support critical thinking with a reciprocal dialogue between teachers and students about appropriate online behavior for academic purposes; however, these dialogues should also be taking place between children and parents (or other influential adult figures) to address a wide range of online interactions. Concurrently, Pusey and Sadera (2012) recognized that a combined effort of all stakeholders, especially teachers and teacher educators, is necessary to provide learning for ethics, safety, and security when using the Internet. Furthermore, Rice et al. (2015) asserted there should be a combined effort of the instructional technology department, teachers, and parents to maintain computer security and establish responsible and ethical practices when engaging in cyber activities.

To have a future that promotes humanity, educators need to help students find balance between having an avid online presence and having "a sense of personal, community, and global responsibility" in technology use (Ohler, 2011, para 4). Ohler (2011) proposed, "School is an excellent place to help kids become capable digital citizens who use technology not only effectively and creatively, but also responsibly and wisely" (para 4). Teachers play an important role in the evolution of society because teachers must consistently adapt to the development of innovations and change in knowledge and be open to these developments (Ozdamli & Ozdal, 2015). Furthermore, teachers should possess the necessary skills for using "new information-communication technologies" and be actively using them to enhance the learning in their classrooms to support the current and future educational needs of students (Ozdamli & Ozdal, 2015, p. 720). Finally, despite rapid changes in

technology, teachers and preservice teachers need specific informational-technology skills to model the proper use of technology so students will develop as digital citizens (Greenhow, 2010; Karal & Bakir, 2016).

Teacher Beliefs, Knowledge and Professional Practices for ICT and Digital Citizenship

According to a considerable number of meta-analyses on teacher beliefs, results revealed that teachers are have the most important impact on learning and the level of pedagogy is essential in developing the quality of education (Acedo & Hughes, 2014; William, 2011). Educational ideals and fundamentals of the 21st century are more complex than in any previous century. Various curriculum content has a less direct cause and effect relationship; instead, greater emphasis rests on the influence of the multitude of information, data, and media sources. Individuals require greater skills to navigate, analyze, and evaluate to be successful problem solvers (Acedo & Hughes, 2014). Educators need instructional-technology-education curriculum design to support the changing demands of society and technology use (Patesan & Bumbuc, 2010). Graduates require a range of digital-literacy skills to enter the workforce; therefore, teachers have the added responsibility of ensuring students gain these skills in their formal education (Lowenthal, Dunlap, & Stitson, 2016).

Many researchers have shown that teachers have a positive perception of the use of technology in the classroom and believe mobile devices can significantly benefit the educational experience (Domingo & Gargante, 2016; Inan & Lowther, 2010). Additionally, teachers' attitudes toward computer usage in their classroom and their likelihood of incorporating technology into their implemented instructional practices relates to their comfort level with ICT (Inan & Lowther, 2010; van Braak et al., 2004). Badia, Meneses, Sigalés, and Fábregues (2014) conducted a random participant-survey study in 356 schools with 702 K–12 teachers to determine factors that influence perceptions about digital technology effectiveness. Participants responded to Likert-type scale items about their level of agreement with ICT infrastructure, policy, and programming. The researchers found that school policies about ICT teaching practice controlled teachers' perceptions of effective training plans, access to devices, and personal levels of digital literacy (Badia et al., 2014).

Crichton, Pegler, and White (2012) deployed a mixed-methods study using online surveys, ongoing teacher professional development meetings, classroom observations, and analysis of lesson plans and student work samples to identify specific attributes or commonalities that needed to be in place to support this type of technology integration. The study used teacher participants who were tasked with trying out iPod touch and iPad handheld devices. The purpose of the study was to understand the necessary infrastructure to support the use of handheld devices for instruction in urban K–12 schools in Canada. Crichton et al. chose five classrooms from schools across the district, based on stakeholders' willingness and school population diversity. In Phase 1 of the study, the researchers gave classroom teachers a class set of iPod Touches, a laptop, syncing cart, and document camera. In Phase 2, the researchers selected three schools based on an application process that highlighted their experience with inquiry-based teaching and willingness to purchase the necessary hardware. Study findings indicated that participants believed educational reform for increased device use would be best supported with stronger distribution and management policies geared toward student safety (Crichton et al., 2012). This study focused on policy reform for students' Internet security, but additional research would be needed to see if policies would be effective over time.

Furthering consideration of hardware and software use, Domingo and Gargante (2016) conducted a survey study in 12 primary schools in Spain using 102 teachers, asking participants about their perceptions of the influence of mobile technology on learning and their use of specific applications. The researchers analyzed the data using descriptive statistics to identify specific applications deemed relevant for use. Additionally, they analyzed survey items using the Whitney *U* nonparametric test to identify any differences between classroom and nonclassroom users of specific applications. Research results revealed that teacher knowledge about classroom technology use predominantly built on specific actions or plans; teachers' beliefs related to their willingness to dedicate time and their personal perceptions of technology's impact on learning. Additionally, Domingo and Gargante asserted that to promote technology use in meaningful ways for the classroom, it is vital to comprehend the perceptions of teachers. The development of society over time shapes students' futures; therefore, educators instructional planning for technology use should encompass not only dynamic and engaging but informative and valuable learning opportunities to benefit students' future (Kennedy, Judd, Churchward, Gray, & Krause, 2008; as cited in Snyder, 2016).

Shifting from student use to teacher perspectives and use of technology, Roach & Beck (2012) conducted a qualitative, inquiry-focused case study of one teacher's personal habits when using social-media sites like Facebook. Researchers coded and analyzed status updates and public digital conversations to see what types of

personas people developed or communicated in the Facebook public view. Findings revealed patterns in attitude or feelings in the teacher's posts on a personal news feed or by respondents or audience to the news feed. Common attitudes and feelings posted by the teacher or the audience consisted of lamenting, affirming, planning, challenging, confessing, and justifying (Roach & Beck, 2012, p. 248).

This inquiry attempted to identify certain trends and topics that might evoke more interest in writing independently and collaboratively in support of new literacy-based writing curriculums in classrooms. One recommendation of the researchers was for teachers to use broad questioning, especially around ethical or value-laden topics, as a way to spark written dialogue (Roach & Beck, 2012). Additionally, teachers should use social-media sites as sources of reading to support students' development of purposeful writing by examining and building an understanding of language use, context, and audience choice in public posts and status updates. Finally, using social media to support writing can help students develop their own norms for what they believe is acceptable and unacceptable communication in public and collaborative online environments (Roach & Beck, 2012).

Continuing the focus on teacher use of technology, Harshman and Augustine (2013) conducted a qualitative case study of 126 teachers from 30 countries working at International Baccalaureate schools that used asynchronous online discussion forums for professional development on global citizenship and international mindedness. The researchers conducted content analysis of online discussion forums, email exchanges, and interviews completed through Skype. As in transformative learning, Harshman and Augustine noted that participants defined global citizenship as on a spectrum and being an aspect of habits of mind, where individuals are initially most comfortable with what they have always known, but through their interactions with other people, change their perspectives and become more open and globally minded (Harshman & Augustine, 2013). Digital learning enriches students, transforming their education to prepare them for future work that emphasizes global digital learning (Gazi, 2016).

Participants' exposure to multicultural perspectives, either from working with colleagues from different nations at their schools or participating in professional development helped them adapt their viewpoint on what global citizenship means (Harshman & Augustine, 2013). The study was a collaborative online, asynchronous discussion forum that allowed participants to interact in a meaningful way with other participants and to have time to compose thoughtful and meaningful responses. Additionally, teacher participants portrayed and elaborated on the behaviors they described and hoped their students would exhibit as global citizens. This type of interaction allowed the researchers to discern a more comprehensive sense of participants' understanding and perspectives on global citizenship. Participating in online activities where individuals are exposed to a diverse group of people can support aspects of citizenship education (Harshman & Augustine, 2013).

With respect to integration of technology, Zheng, Warschauer, Lin, and Chang (2016) conducted a meta-analysis of 96 research studies to determine the impact of 1:1 programs on student achievement. Studies included in the meta-analysis were K–12 schools using 1:1 laptop programs (no other technologies such tablets or iPads). The researchers did not describe the programs; instead, they provided an empirical examination (Zheng et al., 2016). Although this study did not directly focus on teacher knowledge of ICT or digital citizenship, it did support understanding of how technology integration affects educators and their decisions in making instructional choices. Zheng et al. (2016) identified how students' individual access to technology affects classroom instruction. Through a meta-analysis, Zheng et al. found 1:1 programs had a positive impact on student achievement, specifically in English language arts, after the first year of implementation. Teachers and students needed a year to adjust to the new instructional paradigm. Students in 1:1 programs also showed greater achievement on computer-based tests after the first year of implementation. Additionally, 1:1 programs helped bridge the gap in the digital divide by providing access to students who might not have technology access at home, thereby leveling the economic playing field.

More student-centered learning activities took place as well as increased digital-literacy-related tasks such as writing, editing, publishing, researching, and providing students with immediate feedback as a result of the program (Zheng et al., 2016). The researchers also analyzed results from studies on teacher perceptions, beliefs, and instructional approaches. Results indicated that when teachers did not feel they were supported with training or technical support, they felt negatively toward the integration of technology. Alternatively, when teachers received adequate support and training, they became confident and efficient in their use of technology. Professional development also played a major role in supporting teachers in willingness to integrate technology into their classrooms and adapt instructional practices (Benes, 2013; Baumann, 2016; Inan & Lowther, 2010; Ozdamli & Ozdal, 2015; Taylor, 2007; Tondeur, van Braak, Ertmer, & Ottenbreit-Leftwich, 2016). Zheng et al. (2016) reported Longitudinal studies revealed a positive change in teacher attitudes past the first year of the

laptop program (Zheng et al., 2016). Furthermore, studies showed some evidence that the use of a 1:1 laptop program supported the development of some 21st-century learning skills related to information, media, and technology, such as the components of the element of digital literacy (Zheng et al., 2016).

Teacher Beliefs and ICT

Tondeur et al. (2016) conducted a meta-aggregative review of 14 qualitative studies to determine a relationship between pedagogical beliefs of teachers and their use of technology in education. Findings revealed that teachers' beliefs about effective learning and good teaching practices influenced their professional practice (Tondeur et al., 2016). Additionally, teachers' pedagogical beliefs should be a good indicator of their implemented instructional practices for technology integration (Inan & Lowther, 2010; Miranda & Russell, 2012; Tondeur et al., 2016). Teachers were either teacher centered or student centered and not a mix of both; instructional practices indicated a range of beliefs and habits (Ertmer & Ottenbriet-Leftwich, 2010; Tondeur et al., 2016). Technological and social determinism are blockading educators' ability to view connections between technology education and society (Tillberg-Webb & Strobel, 2011). In conjunction, a barrier to complete technology integration for public education contributed to teacher and administrator knowledge (Benes, 2013). Additionally, principals need adequate technology training to model appropriate actions and make disciplinary decisions that adequately address issues and prevent future problems (Baumann, 2016; Maxwell, Stobaugh, & Tassell, 2011; Persaud, 2010). However, educational stakeholders are beginning to recognize the gap between technology knowledge and their organizations' preparation for digital literacy use (Ribble & Miller, 2013).

Along these lines, Tondeur et al. (2016) recognized this gap and further supported accountability of educational leadership by examining results revealed in a meta-analysis, averring that external and internal factors such as self-efficacy for technology use, administration policies, and parental pressures can influence teachers' beliefs compared to actual practice. In addition, teachers' core pedagogical beliefs are the hardest to change because they interrelate with many topics, actions, and understandings developed from professional experience (Tondeur et al., 2016). Under Mezirow's transformational-learning framework, Taylor (2007) identified the need for teachers to receive comprehensive training and leadership support to alter their teacher practices. To integrate technology that includes curriculum emphasizing ethical and responsible practices for technology use, teachers and administrators need the most current and relevant knowledge and skills for technology use (Ozdamli & Ozdal, 2015). Last, it is also important to understand what teachers know about aspects of technology use and what can influence their beliefs allowing leadership to address any gaps or make programming modifications to support teachers with technology use.

Digital Citizenship Curriculum for K–12 Education

Four aspects of curriculum and learning are intended, written, taught, and hidden (Acedo & Hughes, 2014). Intended curriculum is what teachers plan for their students to learn as a result of the instruction. Written curriculum is the way teachers lay out planned instruction over a school year(s). The taught curriculum is the actionable instruction that happens in real time in the classroom. Finally, hidden curriculum subconsciously happens intentionally or unintentionally as a result of engagement with the other three aspects. Teachers have responsibility to cover these four areas in their instructional practices to provide a complete learning experience for students. The hidden curriculum occurs unintentionally but often aligns with the reality of everyday life (Acedo & Hughes, 2014). Although aspects of instruction occur without the predetermination of the teacher manual, this type of instruction should be covered, particularly in consideration of technology integration and use in the classroom. Digital citizenship is an example of a once-hidden curriculum that is now gaining attention and is pushed to be taught alongside traditional curriculum.

The development of a specific curriculum for digital citizenship would enable digital citizenship to become a taught curriculum (Acedo & Hughes, 2014). By the same token, knowing the basic functionalities of one's devices is invaluable; individuals should be knowledgeable about what protocols are necessary to protect their online profile and sensitive data (Pusey & Sadera, 2012). For instruction focused on technology security to take place, teachers need a well-developed knowledge of technology use and the potential hazards associated with improper use (Skutil, 2014). Educators have a professional responsibility to instruct on digital citizenship to ensure that everyone develops an understanding about poor technology use and learns required actions to counteract misuse of technology (Farmer, 2011). Similarly, elementary school teachers need specific professional development that helps them prepare for technology use in the classroom to ensure students have opportunities to learn the necessary safe practices for technology use (Baumann, 2016).

Because research remains sparse on the topic of digital citizenship, some researchers have attempted to develop instruments to facilitate scholarly understanding of digital citizenship knowledge and beliefs. Ribble (2015), Suppo (2013), Isman and Canan Gungoren (2014), and Choi et al. (2017) attempted to develop instrumentation to assess specific knowledge of digital citizenship definitions, components, and elements. Adopting Ribble and Bailey's (2007) original survey, Suppo (2013) conducted a quantitative survey to determine knowledge and beliefs about digital citizenship instructional practices for superintendents, curriculum coordinators, and technology coordinators working in K–12 public schools in the State of Pennsylvania. With permission, Suppo used a formative-evaluation process to create a more comprehensive Likert-type scale instrument that assessed participants' knowledge of aspects related to Ribble's nine elements. Suppo used content-area experts, including Ribble, to evaluate the question and establish content validity. The survey consisted of 36 knowledge-based questions, 17 policy and professional practice questions, and two beliefs in instructional practices in participants' school-district questions.

Suppo (2013) analyzed data using descriptive statistics to compare the means of responses for each of the nine elements across the variables of age, gender, and district type (rural, urban, and suburban). Also, the researcher conducted a three-way ANOVA to determine if the variables affected digital citizenship beliefs and a chi-square test to determine if a connection existed between curriculum implementation and district type (Suppo, 2013). Suppo intended to reveal if a connection existed between beliefs about digital citizenship and the actual professional practice of implementing a digital citizenship curriculum at various school levels. However, research results revealed a relatively small correlation between variables. Alternatively, Isman and Canan Gungoren (2014) conducted a reliability and validity test for a 34-question scaled survey tool to be used in studying digital citizenship knowledge and the knowledge of responsible and ethical online behavior. Test participants were from a population of university members including professors from the college of education and perspective teachers from a range of disciplines and teaching levels. Results revealed that the survey would be a useful measurement tool that could be used in future studies connected to digital citizenship knowledge. Although this survey tool does not explicitly use Ribble's nine elements of digital citizenship, it does add to the field of study in helping to develop research instruments to determine digital citizenship knowledge (Isman & Canan Gungoren, 2014).

Continuing with instrument development, Jones and Mitchell (2015) conducted a self-report survey scale of 979 youths, aged 11–17, from New England. As part of a larger study on cyberbullying, the researchers developed a scale to measure the construct of respectful online behavior and online civic engagement, and to operationalize a definition of digital citizenship in educational curriculum. Results revealed a negative correlation between age and behavior in that, as the age of the participants increased, the level of online respect and online civic engagement decreased. When Jones and Mitchell analyzed items based on gender, girls showed higher levels of online respect and online civic engagement than male participants. For the larger study on cyberbullying and harassment, participants who reported having respectful online behavior and civic engagement also reported lower incidence of participation or victimization in the form of cyberbullying. The results of Jones and Mitchell's study aligned with the view of Gazi (2016), Martens and Hobbs (2015), Ohler (2011, 2012), Oyedemi (2015), Ribble (2015), and Ribble and Miller (2013) that digital citizenship should be addressed at younger ages.

Quite recently, Choi et al. (2017) conducted a formative-evaluation process to develop a digital citizenship scale instrument that researchers could use to understand holistically to establish individuals' online behavior unique to digital citizenship criteria. In the instrument Choi et al. (2017) developed, they used four categories or themes specific to the concept of digital citizenship as subscales: Digital Ethics, Media and Information Literacy, Participation/Engagement, and Critical Resistance. The final product consisted of a 26-item, 5-point scale to self-assess one's Internet abilities, perceptions or self-efficacy, and participation in online communities, dubbed the Digital Citizenship Scale (Choi et al., 2017).

Choi et al. (2017) used a three-phase formative development and evaluation process involving an extensive literature review, content analysis by a panel of experts, and a sample test to establish content validity and instrument reliability. They sorted the questions developed to determine digital citizenship knowledge into four factors: Internet Political Activism, Technical Skills, Local/Global Awareness, Critical Perspective and Network Agency, based on themes determined from a literature review (Choi et al., 2017, p. 18). In addition to content-based questions about Internet knowledge and digital citizenship, Choi et al. (2017) adopted the State-Trait Anxiety Inventory to discern the stress levels of participants toward web-based activities. The researchers conducted formal research using 508 participants ranging in age from 18 to 35, categorized as either undergraduate or graduate university students from two different educational institutions. Study results revealed

Internet self-efficacy positively correlated with digital citizenship competency, and Internet insecurity or anxiety negatively correlated with digital citizenship competency. The identified themes and factors in the Choi et al. (2017) survey tool were labeled differently from Ribble's nine elements of digital citizenship; however, educators can draw similarities between the Choi et al. themes and factors and Ribble's nine elements.

Digital ethics are a user's ethical, safe, responsible behavior when interacting online (Choi et al., 2017; Hollandsworth et al., 2011; Ribble et al., 2004; Winn, 2012), and provide the basis on which Ribble's nine elements developed. The theme of Media and Information Literacy, identified by Choi et al. (2017), along with the factor labeled "technical skills" closely relate to Ribble's elements of digital communication and digital literacy because they describes how users search, access, and evaluate content on the Internet as well as the communication and collaborative nature of many Web 2.0 tools. One can view the theme of Participation/Engagement and Critical Perspective and Network Agency as indicating how one interacts with different media to participate in "political, economic, social, and cultural … activities" (Choi et al., 2017, p. 10; see also Citron & Norton, 2011; Ohler, 2012) through actions such as posting, sharing, saving, and buying and selling, which relate to Ribble's elements of digital etiquette, digital law, and digital commerce. Finally, Critical Resistance and Local/Global Awareness indicate participation in activities that promote social justice (Choi et al., 2017; Coleman, 2006; Herrera, 2012) relating to elements of digital access, digital law, and digital rights and responsibilities.

Choi et al. (2017) showed that researchers are starting to devote time to developing reliable and valid instruments that can be used to support studies about digital citizenship knowledge and personal practice. The research study by Choi et al. (2017) is specifically important to the present study, as the formative evaluation process that was used to determine the validity and reliability of the instrument was also used for this study. Choi et al. (2017) did not specifically address all the variables under investigation, so using the Digital Citizenship Scale is not an appropriate choice for this study; therefore, I developed a different instrument.

The above-mentioned studies indicated the current state of available literature connected to Ribble's nine elements or digital citizenship in general. These studies revealed that Ribble's elements provide a backbone for establishing a curriculum that integrates with ethical and responsible use of technology as well as time and interest in developing valuable tools to assess competencies for digital citizenship. However, insufficient research persists about what current in-service teachers specifically know or believe about digital citizenship or what they are already doing to address digital citizenship in their classrooms.

Conclusion

The focus of this literature review was to determine what knowledge has already been found on the topic of digital citizenship with emphasis on elementary teachers' beliefs, knowledge, planned, and implemented instructional practices. The body of knowledge for the topic of digital citizenship has shown that researchers predominantly studied higher education, preservice teachers, or the middle and high school years, with students. Research results showed that despite being identified as digital natives, growing up not ever knowing a time when the Internet and mobile devices were not readily available, these groups of middle school aged to university students still lack a complete understanding of what constitutes acceptable, ethical, and responsible use of technology (Boyle, 2010; Davis et al., 2010; James et al., 2010; Karal & Bakir, 2016; Lindsey, 2015; Pusey & Sadera, 2012; Sincar, 2011, 2013). Additionally, research on poor student behavior with an emphasis on social media and cyberbullying (Davis & James, 2013; Jones & Mitchell, 2015; Park et al., 2014; Ribble & Miller, 2013) showed that although cyberbullying is a recognized problem in a more networked and technology-dependent society and deserves to be studied deeply, it is not the only aspect of digital citizenship.

Scholars such as Hobbs and Jensen (2009), Ribble et al. (2004), Ohler (2011, 2012), Ribble (2012), Ribble and Miller (2013), and Curran, Ribble, and Ohler as cited in Impero Software and Digital Citizenship Institute (2016) focused on digital citizenship and wrote articles proposing the implementation of curriculum to support teachers and students in learning to make appropriate, responsible, and ethical decisions when accessing and using the wide range of media that comprises Web 2.0. However, specific research on what teachers and students know or believe about digital citizenship, especially at the elementary level, remains dramatically understudied.

With regard to teacher planned and implemented instructional practices, many studies conducted on teacher efficacy and beliefs about the use of technology in the classroom showed that teachers believe technology can enhance the learning environment (Inan & Lowther, 2010); however, researchers also showed that training,

infrastructure, and leadership are barriers (Baumann, 2016; Benes, 2013; Ozdamli & Ozdal, 2015; Taylor, 2007; Tondeur et al., 2016). Of all the studies reviewed on ICT use in the classroom, no study identified digital citizenship as a component of ICT integration. Most studies focused on digital literacy, a single component of digital citizenship.

Despite some research on instrumentation developed to fully assess individuals' knowledge of digital citizenship or cyber ethics behavior (Choi et al., 2017; Isman & Canan Gungoren, 2014; Jones & Mitchell, 2015), research is minimal and quite recent. In contrast, discussions on digital citizenship, including definitions and concept development, has been ongoing since the early 2000s. Ultimately this literature review revealed a gap in the literature about what educators know or believe about digital citizenship and what educators are doing to implement digital citizenship elements into their instructional practices, especially at the elementary level.

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