Middle School Students' Social Media Use

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ABSTRACT
Cyber bullying, digital identity, impact of digital footprints, and use of inappropriate social media are topics that are gaining attention in K-12 schools. As more schools and school districts are implementing 1-1 and "bring your own technology" initiatives, attention to these topics is becoming increasingly important. A total of 593 middle school students were surveyed about digital footprints and concerns about social media. The results show that 17% started using social media at age nine or younger, 40% accepted friend requests from people they do not know, and 40% reported that their parents did not monitor their social media use, which calls for the needs of cyber-security education. These middle school students reported using social media most often to connect with their friends, share pictures, and find out what others are doing. They indicated that Instagram (27%), SnapChat (25%) and YouTube (25%) were their most used social media sites. These students have concerns about social media due to inappropriate postings, getting hacked, getting their feelings hurt, lack of privacy, inappropriate pictures, bullying, negativity, and stalkers. This study informs teachers, administrators, technology facilitators and parents on social media use by students.

Keywords
Digital citizenship, Social media use, Middle school, Digital footprints

Introduction

As students are increasingly engaged in technology and cyber learning at very young ages, there is a heightened concern for their safety. Cyber bullying, impact of digital footprints, and inappropriate use of social media are topics that are gaining attention. As more schools and school districts are implementing 1-1 and "bring your own technology" initiatives (Dunleavy, Dexter, & Heinecke, 2007; Lowther, Ross, & Morrison, 2003) attention to these topics is critical to the welfare of our students. The literature on social media use among teenagers points to benefits as well as risks for this population. On one hand, social media use provides great opportunities for connecting with others, creating and being part of online communities that foster creativity, knowledge and civic participation. For example, Facebook allows students to connect outside the classroom and collaborate on assignments and projects, thus creating more opportunities for learning. Through social media, youth can find out about volunteering opportunities and local political events (O'Keefe & Clarke-Pearson, 2011).

On the other hand, social media use presents several societal risks for middle school and high school students. Many have expressed concerns that this use may have negative impacts on various areas of teenage life. This was supported by a study that indicated that Internet use as little as three hours per week could lead to depression and social isolation in teenagers (Kraut, Patterson, Lundmark, Kiesler, Mukopadhyay & Scherlis, 1998). However, a recent study conducted with 130 7th-graders from a middle class public school in California on Internet use revealed that overall Internet usage had no significant correlation with psychological adjustment. Interestingly, this study found that teenagers who scored higher on social anxiety and loneliness measures were more likely to communicate via instant messaging with acquaintances. Even teenagers who felt well supported and connected to their peers at school sought out additional opportunities to interact with people they did not know well but very few close friendships were actually developed online (Gross, Juvonen & Gable, 2002). This raised questions about whether or not this makes anxious and lonely adolescents more vulnerable to online predators.

To investigate this issue, Dowell, Burgess and Cavanaugh (2009), surveyed 404 middle school students on their engagement in online risky behaviors. 31% of the sample reported posting personal information on social networking sites, including a picture of themselves. Twenty two percent of boys (compared to 6% of girls) reported having searched the topic of sex on the Internet and roughly, 40% of both boys and girls reported having encountered sexually inappropriate material on the Internet. Approximately 28% of the participants reported being harassed or bullied on social media sites. Furthermore, the results of this study indicated that simply posting your picture on a social media site did not necessarily constitute a risky behavior. However, the clustering of various risky behaviors such as posting the name of school and email address, corresponding with unknown persons, initiating online sex and online harassment, and overriding Internet filters and blocks may place vulnerable youth at jeopardy (Dowell et al., 2009). However, others have argued that previous claims that social networking sites present a great risk of victimization, as in unwanted sexual harassment and solicitation,

seem to be unfounded. Out of 1588 middle school students surveyed recently on this issue, 15% reported an unwanted sexual solicitation online (Ybarra & Mitchell, 2008).

A recent large national survey of 1588 middle school youth, ages 10-15, found that 32% had experienced online harassment, among which, 43% were via instant messaging (IM) in chatrooms and 28% via social networking sites (Ybarra & Mitchell, 2008). However, some empirical data is inconsistent with these results. For example, a recent study examining cyber bullying amongst middle school students was conducted with 1,915 girls and 1,852 boys in grades 6, 7, and 8 who attended any of six elementary and middle schools in the southeastern and northwestern United States (Kowalski & Limber, 2007). In this study only 11% ($n = 407$) of the students qualified as victims of cyber bullying and 78% ($n = 2961$) had no experience with cyber bullying. Cyber bullying victims are also victims of school bullying with nonheterosexual youth reporting more incidences. Cyber bullying leads to elevated levels of distress and depression and sometimes to suicide attempts (Schneider, O'Donnell, Stueve, & Coulter, 2012). Generally speaking, social media sites may influence suicide-related behavior negatively as well as positively. For example, studies have found that youth often encounter suicide-related content on message boards, chatrooms and YouTube videos. However, social networking sites such as YouTube and Facebook can also help with suicide prevention by providing information and connection to suicide prevention websites and hotlines (Luxton, June & Fairall, 2012).

Digital citizenship

The results on the use of social media have resulted in the need to educate K-12 students on becoming digital citizens who exhibit "the norms of appropriate, responsible behavior with regards to technology use" (p. 7) as defined by Ribble (2004). International Society for Technology in Education (ISTE) lists digital citizenship as an important aspect of educational technology. Ribble (2014), in his book titled "Digital citizenship in schools," lists 9 elements of digital citizenship under the framework of Protect, Respect, and Educate.
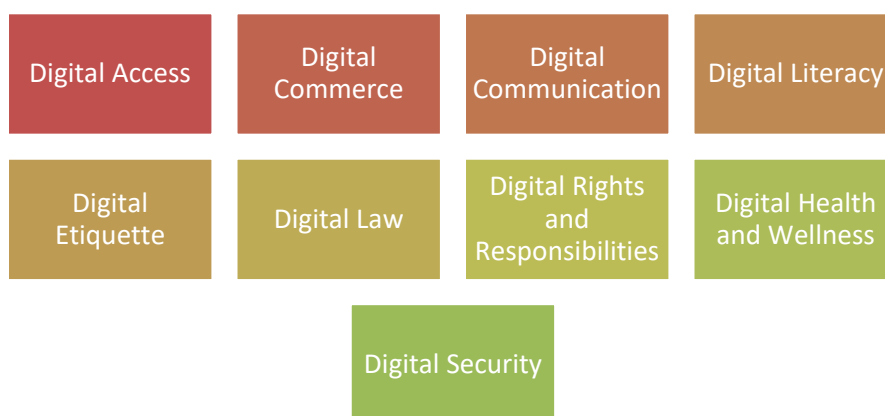

Figure 1. Nine elements of Digital Citizenship based on Ribble's framework

International Society for Technology Education in their National Educational Technology Standards for students (NETS-S) focus on Digital Citizenship in standard 5 (ISTE, 2016) (See Table 1).

Table 1. NETS-S Standard 5 – Digital Citizenship

NETS-S Standard 5 – Digital Citizenship	
Students understand human, cultural and societal issues related to technology and practice legal, and ethical behavior	• Advocate and practice safe, legal, and responsible use of information and technology • Exhibit a positive attitude toward using technology that supports collaboration, learning, and productivity • Demonstrate personal responsibility for lifelong learning • Exhibit leadership for digital citizenship

In the section below, we review some of the key digital citizenship topics that K-12 students need to be educated about based on Ribble's framework and ISTE NETS-S Standard 5.

Cyber bullying

One of the most talked about risks of social media use among teenagers is cyber bullying and online harassment, which is defined as "deliberately using digital media to communicate false, embarrassing, or hostile information about another person" (O'Keefe & Clarke-Pearson, 2011). Cyber bullying takes place when someone deliberately upsets or harasses someone else repeatedly using online or mobile technology. Signs of cyber bullying are when kids harass or embarrass others publicly, spread rumors, post hurtful information or images online, or say mean things that humiliate others in public. The effects of cyber bullying on students can lead to depression, thoughts of violence, and even suicide. When cyber bullying occurs, there is an obvious misuse of the online or mobile technology, requiring parents and schools to get involved (Ahn, Bivona, & DiScala, 2011; Al-Khateeb, & Epiphaniou, 2016).

Digital netiquette

When students are online interacting with others there are some "unspoken rules" that guide them on how to behave and communicate called netiquette (Brown, 2014). Students need to learn the do's and don'ts of appropriate online behavior. Typically, different sites or online interactions require specific netiquette. For example, Facebook requires certain netiquette when posting comments, such as being polite, avoiding sarcasm, and avoiding rudeness or "shouting" (writing in ALL CAPS). Netiquette is also required when posting images, such as being authentic or linking to sources. Bottom line, basic netiquette is required to avoid discriminatory, defamatory or derogatory remarks online, and encourage being respectful and sensitive to others' cultural differences. Researchers have designed reward based systems to help children develop good behaviors online (Valentine, Leyva-McMurtry, Borgos-Rodriguez, & Hammond, 2016).

Digital footprints

The culture of sharing information online is great for young people who want to express themselves, collaborate, and socialize with others. However, students need to become aware of the "digital footprint" they leave online and reflect on the kind of personal information they share about themselves (Grayson, 2011; Madden, Fox, Smith, & Vitak, 2007; Malhotra, Totti, Meira Jr, Kumaraguru, & Almeida, 2012). Today, anything can be created, copied, pasted, and shared to thousands of people online almost instantly. Each online post, image, or message is permanent and stored as a "digital footprint" that can be retrieved years later by classmates, teachers, college admissions officers, future employers, or the general public. Students should understand the public and permanent nature of the Internet so they can begin to build a positive digital footprint. Students need to learn more than just how to guard personal information, how to protect their own privacy, and how to respect others' privacy. Guiding students to self-reflect before they self-reveal is a fundamental technique to assist them with consciously managing how they decide to present themselves online.

Digital privacy

Most middle school students are now accessing email, social media, online videos, and games, most of which require log in accounts, usernames and passwords. Students should learn how to create strong passwords and protect their private information on their user accounts. Aside from this, students must be careful about permissions when downloading files, media, or content online; most websites have privacy, copyright, plagiarism, fair use, and creative credit policies that students need to be aware of. For older students, it is necessary to understand the concept of identity theft, data theft, online viruses, and online scams, where third party companies "steal" personal information such as passwords, credit card information, and social security numbers to commit crime or fraud online. Students need to know where the boundaries are when sharing information about oneself and others online.

Digital identity

A vital part of growing up is forming our identity. Identity is often reflected as how you perceive yourself as well as how others perceive you. It is manifested in our relationships with others, our sense of self, and reputation. As students navigate websites and use various apps on their mobile devices, they use photos (i.e., avatars), "likes," and "favorites lists" for example, to show (or hide) different aspects of their identities. Many times, people can

choose to be "anonymous" when they are asked to present an online identity, however, this is not the case offline. Students need to understand the similarities and differences in how they present themselves online and offline, particularly what it means to be responsible for their actions even when they are not easily identifiable or anonymous. Students also need to consider how different forms of self-expression forms their online identity and how online identity can be different from one's real self.

Middle school students and social media use

A 2013 report of the Pew Research Center's Internet & American Life Project on teen social media usage between 2006 and 2012, reported that 95% of teens (N = 802) ages 12-17 used the Internet and eight out of ten online teens used some kind of social media, mainly Facebook and Twitter. Facebook attracted 77% of online teens. Still, 24% of online teens used Twitter, a figure that is up from 16% in 2011 and 8% in late 2009. Teenagers' use of Twitter now overtakes that of adults (Madden, Lenhart, Cortessi, Gasser, Duggan, Smith, & Beaton, 2013). Overall, 94% of teens said they have a Facebook profile, and 81% said that Facebook is the profile they use most often. One in four teens said that they have a profile or account on Twitter and 11% have a profile or account on Instagram. By comparison, only 7% of teen social media users said they maintain a Myspace account, and none of the survey respondents said MySpace is the account they used most often. That is in stark contrast to the 85% of teens who said in 2006 that MySpace was their most frequently used profile (Madden et al., 2013). In 2015, according to the Pew Research Center statistics, 71% of youth between ages 13-17 (N = 1,060) use Facebook, followed by Instagram (52%), Snapchat (41%), Twitter (33%), Google+(33%), Vine (24%), and tumbler (14%) and 71% reported using two or more sites (Lenhart, Duggan, Perrin, Stepler, Rainie & Parker, 2015)

Older teens that are social media users more frequently share: photos of themselves on their profile (94% older teens vs. 82% of younger teens), their school name (76% vs. 56%), their relationship status (66% vs. 50%), and their cell phone number (23% vs. 11%) (Madden et al., 2013). The 2004 Pew Research Center's Internet & American Life Project survey, showed that 39% of online teens shared their own artistic creations online, such as artwork, photos, stories, or videos, 33% created or worked on webpages or blogs for others, including those for groups they belong to, friends, or school assignments, 28% created their own online journal or blog, 27% maintained their own personal webpage, 26% remixed content they found online into their own creations (Lenhart, Madden, Rankin & Aaron, 2007).

Parents of the surveyed teens were asked a related question: "How concerned are you about how much information advertisers can learn about your child's online behavior?" A full 81% of parents report being "very" or "somewhat" concerned, with 46% reporting they are "very concerned." Just 19% report that they are "not too concerned" or "not at all concerned" about how much advertisers could learn about their child's online activities (Madden et al., 2013). In this report, 65% of 12-13-year-olds use social media compared to 89% of 14-17-year-olds. Amongst the younger teens (12-13), 52% report using social media daily compared to 73% of older teens (14-17). Older teens tend to visit social media several times a day and tend to have a larger number of friends or followers than younger teens (Lenhart et al., 2015). Due to the widespread availability of smartphones, 24% of youth between ages 13-17 go online almost constantly. The Pew Research Center reported in 2015 showed that 87% of teens (N = 1,060) had access to a desktop or laptop computer, 81% had access to a gaming console, 73% had access to a smartphone, 58% a tablet computer, and 30% a basic cell phone. The report indicated that 91% of teens accessed social media sites using the Internet on their smartphones (Lenhart et al., 2015).

Purpose of this study

The major research study in this area of middle school social media use was from the Pew Research Center. There is a need for more studies to validate and add to these findings in different contexts. The current study was conducted in two middle schools in Southeastern United States. The purpose of this study is to gather middle school students' perceptions on the use of social media and their opinion towards cyber safety. The following questions were answered in this study:
- Which social media tools do middle school students use?
- Which social media sites do middle school students use most?
- Which social media site is a favorite among middle school students?
- What activities do middle school students do on social media sites?
- What technologies do middle school students use to access social media?

- Do parents of middle school students monitor their use of social media?
- Do middle school students accept friend requests from people they do not know?
- How old were the middle school students when they started their social media account? Is there a gender difference?
- How many times do middle school students check their social media account per day? Is there a gender difference?
- What do middle school students like the most about using social media?
- What bothers middle school students the most about using social media?

Methods

Participants

Five hundred and ninety-three middle school students (6th to 8th grade) from two schools in the Southeastern region of the United States completed a survey about their online activity on social media and their concerns about social media. One school was represented by 238 (40.1%) students and the other school was represented by 355 (59.9%) students. The age of these students ranged from 12 to 16 with a mean of 13.32 and a standard deviation of 0.55. The distribution of gender is 50.6% ($n = 300$) female and 49.4% ($n = 293$) male.

Survey

A survey with 14 items was designed to collect information about the participants' use of social media and their opinions towards cyber safety. Other than gender (Item 1) and age (Item 2), the participants were asked to respond to multiple-choice questions: Which social media tools they used (Item 3); Which social media site they used the most (Item 4); Which social media site was their favorite (Item 5); What things they did on social media sites (Item 6); Which technologies they used to access social media (Item 7); Whether or not their parents monitor their use of social media (Item 8); Whether they accept friends requests from people they do not know (Item 13). The participants were also asked to respond to three open-ended questions: How old were they when they started their social media account (Item 9); How many times did they check their social media per day (Item 10); What they like the most about social media (Item 11); and What bothers them the most about social media (Item 12).

Data analytical procedure

Descriptive statistics were used to report the frequency and percentage of the categories participants chose as responses to the multiple-choice questions. Independent samples t-tests and Chi-square tests were employed to see if the responses differed by gender. Responses to open-ended questions were coded using thematic analysis. Qualitative data were coded into meaningful categories and then organized into themes through comparison, contrast, and identification (Sangasubana, 2011).

Results

Research question 1: Which social media tools do middle school students use?

The most popular social media tool that middle school students use is Instagram, which was reported by 432 (72.85%) students. The next popular tools were Snapchat and YouTube, each was reported by 385 (64.92%) students. Table 2 is a list of all tools used by the participants in this study.

Table 2. Social media tools that middle school students use

	Instagram	Youtube	Snapchat	Vine	Pinterest	Facebook	Twitter	Kik	GooglePlus	Flickr
n	432	385	385	197	188	185	177	99	94	5
%	72.85	64.92	64.92	33.22	31.70	31.19	29.84	16.69	15.85	0.84

Research question 2: Which social media site did middle school students use most?

Consistent with the responses to Question 1, Instagram ranked the top of all the social media sites that middle school students use most. The frequencies of social media sites that were reported by the students were presented in Table 3.

Table 3. Social media site that middle school students use most

	Instagram	Youtube	Snapchat	Facebook	Twitter	Pinterest	Vine	GooglePlus
n	158	148	146	45	13	12	9	7
%	26.64	24.96	24.62	7.59	2.19	2.02	1.52	1.18

Research question 3: Which social media site is a favorite among middle school students?

Snapchat was the favorite social media site for the participants in this study (Table 4).

Table 4. Favorite social media site among middle school students

	Snapchat	Youtube	Instagram	Facebook	Kik	Pinterest	Twitter	Vine	GooglePlus
n	149	144	119	34	24	22	21	17	2
%	25.13	24.28	20.07	5.73	4.04	3.71	3.54	2.87	0.34

Research question 4: What activities do middle school students do on social media sites?

The most popular activity is posting pictures. Table 5 shows the frequency of the activities reported by the participants.

Table 5. Activities middle school students do on social media sites

	Post pictures	Read other's posts	Delete videos	Comment on others' posts	Post videos	Delete pictures
n	494	397	333	333	234	209
%	83.31	66.95	56.16	56.16	39.46	35.24
	Reshare others' posts	Reshare others' videos	Reshare others' pictures	Post status updates	Delete my posts	Delete my comments
n	150	129	129	110	69	39
%	25.30	21.75	21.75	18.55	11.64	6.58

Research question 5: What technologies do middle school students use to access social media?

The students used smartphone, laptop/Chromebook/Macbook/netbook, tablet/iPad, desktop computer, and gaming system (X-box). Table 6 is the frequency of the use of these technologies.

Table 6. Technologies middle school students use to access social media

	Smartphone	Laptop	Tablet	Desktop	X-Box
n	503	489	283	109	40
%	84.82	82.46	47.72	18.38	6.75

Research question 6: Do parents of middle school students monitor their use of social media?

Table 7 shows the frequency counts of students' report of whether or not their parents monitor their use of social media.

Table 7. Parents' monitor of social media

	Female	Male	Total
I am not sure	35	54	89
No	115	120	235
Yes	150	119	269

Chi-square test showed a statistically significant difference between boys and girls with regard to their parent's monitoring. Parents of girls seemed to monitor more than parents of boys, χ^2 (2, 593) = 7.62, p = .02.

Research question 7: Do middle school students accept friend requests from people they do not know?

Table 8 is the frequency counts of students' report of whether or not they accept friends' requests from people they do not know.

Table 8. Accept friends' request from strangers

	Female	Male	Total
No	168	186	354
Yes	132	107	239

Chi-square test failed to show a statistically significant difference between boys and girls with regard to their acceptance of friends' request from strangers, χ^2 (1, 593) = 3.45, p = .06.

Research question 8: How old were the middle school students when they started their social media account? Is there a gender difference?

Table 9 shows the frequency distribution of the age when children started using social media.

Table 9. Age Middle School Students Started Using Social Media

	Age 9 or younger	10	11	12	13	14	15	16
n	102	121	149	143	57	12	1	8
%	17.20	20.40	25.13	24.11	9.61	2.02	0.17	1.35

Independent samples t-test revealed statistically significant differences in gender, t(591) = 3.64, p < .001. Girls started using social media at an earlier age (M = 10.81, SD = 1.27) in comparison to boys (M = 11.24, SD = 1.57).

Research question 9: How many times do middle school students check their social media account per day? Is there a gender difference?

The reported frequency of daily use of social media ranged from zero to 300 with a mean of 12.74 and a standard deviation of 48.48. Independent samples t-test revealed girls used social media significantly more (M = 19.69, SD = 64.30) than boys (M = 9.47, SD = 22.71), t(533) = -2.45, p = .02.

Research question 10: What do middle school students like the most about using social media?

In response to the question "What do you like most about Social Media?" among 593 students four broad categories evolved during coding: information, communication, entertainment, and general (See Table 10).

 In the information category, 127 students mentioned the knowledge social media provides for them to learn about other people's/friends' lives, what they are doing, and what is new with them. Having knowledge about news around the world (13), the ability to communicate with people around the world (12), the ability to upload videos (12), the functionality of posting pictures (11), and the ability to express yourself (10) were other reasons students mentioned for liking social media.

In the communication category, chatting and communicating with friends is another item that was mentioned by 110 students. The other common themes were interacting/communicating with others (53), seeing what people post (39), sharing/receiving information (36), and staying updated (27) are other popular reasons among students in favor of using social media. Viewing pictures was mentioned by 21 students, and 17 students said sharing what they do or like through social media is why they like using it.

In the entertainment category, using social media as entertainment is another most stated item by 77 students. Sixty-eight students found social media good to stay in touch with their family and friends who do not live close

by or who they do not see often. Watching videos or movies is among the most stated items that students like about social media. Sixty students said they like social media because the can watch videos or movies by it. However, 15 students said they either do not have social media or do not use it. Ten students stated that they do not like social media.

Table 10. Most liked characteristics of social media by middle school students

Information		Communication		Entertainment		General	
Know what people/friends, are doing	127	Chat/communicate with friends	110	Entertaining	77	Don't have /don't use social media	15
Share /get info /stuff	36	Stay in touch with family and friends out of states or far away/ friends do not go to school with	68	Watch video/movies	60	Nothing/don't like it	10
Stay updated	27	Interacting/communicating with others	53	See posts	39	Everything	8
Share what you do/ like	17	News around the world	13	See picture	21	Share /see experience	7
What celebrities are doing	3	Communicate with the whole world	12	Upload videos	12	I don't know	6
Know what they think about my stuff on SM	2	Express yourself	10	Upload/post pictures	11	Being fast	4
See what others are talking about	2	Meet new people	8	Games	8		
Share memory	2	Texting	7	Post stuff	8		
		Stay in touch	5	Passing time	4		
		Commenting on friend's posts	3	Listening to music	3		
				Show/ see creativity	3		

Research question 11: What bothers middle school students the most about using social media?

In response to what bothers you the most about Social Media, the four broad categories that evolved were content, people/behavior, safety/privacy and Internet (See Table 11).

In the content category, 64 students mentioned that they disliked disturbing or inappropriate posts on social media this was followed by dumb comments mentioned by 19 students.

In the people/behavior category, 85 students mentioned that they do not like meeting people who are mean on social media, followed by bullying and being criticized which was mentioned by 65 students. Twenty-seven students also mentioned drama and too much feeling and 26 students mentioned immaturity of those using social media as things that bother about social media.

In the safety/privacy category, 43 students have concerns about privacy and the accessibility of social media accounts and 24 students mentioned that they were concerned about their social media accounts being hacked.

In the Internet category, 9 students talked about low Internet speed, and startup issues and 8 found waiting time as bothering related to Internet and social media.

In the final category, 61 think there is nothing in social media that bothers them, 13 mentioned that advertisements and spams, also lying and tricks bothered them. Eleven students reported that they did not have social media accounts.

Table 11. Least liked characteristics of social media by middle school students

Content		People behavior		Safety/privacy		Internet		General	
Disturbing/ inappropriate stuff	64	Mean people	85	Privacy/ track you down/ having access	43	No Internet/needs Internet	6	Nothing	61
Dumb comments/ stuff	19	Bullying /criticize	65	Hacking	24	Waiting/slow	8	Adds/spam	13
Inability to control content you see	7	Drama/too much feelings	27	Stalkers	8	Being slow/start up issues	9	Don't have social media	11
Random stuff pup up	3	People don't know how to use it /immaturity	26	Stuff stay there even if you delete it	7	Uses data	3	Not sure/don't know	8
Too many notifications	5	See negative stuff about others /hatred	21	Your pictures end up on google	6			Everything	5
Fake news	2	Sharing too much and everything about self	19	Unsafe /dangerous	5			Boring	5
Too much info	2	Fake people	19					No answer	3
		Lying/ tricks	13					Apps kick me out	3
		People you don't know talking/following	11					Being blocked at school	2
		Creepy people	11						
		Reporting inappropriate and nothing happens	11						
		Arguing	11						
		Show off	11						
		Spending too much time. Neglecting world	10						
		Exposing people	8						
		Gossiping	5						
		Bad people	4						

Discussion

Private information vs. privacy

The survey results demonstrate a very interesting aspect in middle school students' usage of social media: from one side, they try to keep the information that they exchange from adults (especially their parents and teachers), while on the other side, they have not fully established the awareness and capabilities to protect themselves. If we examine the popular social media sites that they use, we can find that traditional sites such as Facebook and Twitter, which are widely used by more mature people (above 25), are less popular with teens. While there has been a lot of discussion on the rise of Snapchat and Instagram (Boyle, Earle, LaBrie, & Ballou, 2017; Piwek & Joinson 2016; Vaterlaus, Barnett, Roche, & Young, 2016), we think that two properties lead to their popularity in the subjects surveyed. First, the parents and teachers of young students are usually more familiar with the social sites such as Facebook and Twitter. Therefore, it is more difficult for grown-ups to effectively monitor the communication contents among young students. Actually, there are articles showing that the user interfaces of

Snapchat are harder to use by people over 25 (Oremus, 2015). The second property is the unique technique in short information lifetime provided by these social sites. For example, people have to access posts in Snapchat within a short period of time or the posts will be removed from the user's device. In this way, less digital footprint will be left for the users.

In contrast to the motivation of students who try to keep social information from their parents and teachers, they have not established full awareness and capabilities to protect themselves in the digital world. This is demonstrated from their willingness to accept friend requests from unknown people: about 40% of surveyed students will accept such requests. While the results do not consider other factors such as "common background" or "closeness of mutual friends" (Rashtia, Boshmaf, Jaferian, & Beznosov, 2014), it is obviously too high when we consider the safety of young students. This number shows that security education for middle school students deserves more efforts and attention.

Gender distinction

In their early stage of middle school, students will acquire a lot of knowledge and capabilities each year. Therefore, their objectives and frequently conducted activities on social sites could vary from year to year. At the same time, boys and girls start to develop different attitudes toward social media (Sentse, Kretschmer & Salmivalli, 2015). For example, our results show that girls are more willing to accept a stranger's friend request than boys. They also check social media updates much more frequently than boys. These results justify the observations that more parents of girls intend to monitor their activities online than those of boys. From this point of view, we need to pay special attention to girls during security education.

Objectives and frequent activities

The activities that middle school students conduct on social media and their objectives should be aligned. The activities shown in Table 4 can be classified into two groups. In the first group, a student updates the contents in her/his social media account. The top operations focus on posting and deletion of videos and pictures. In the second group, the students provide feedback or comments on other people's posts. Surprisingly, from Table 4 we find that the ratio between type 1 and type 2 operations is about 5:4, which means the students conduct more operations to share their stories than to read about others. These results show the intention of the students to express themselves instead of caring about others. This study also found that students use social media for a variety of things. As verified by our study, they keep up with friends, communicate with friends, post pictures, comment on pictures, like the posts of others, and share other information.

Technologies used to access social media – Smartphones and laptops

Our findings indicate that students access social media on smartphones and laptops more frequently than other devices. Consistent with findings of Lenhart et al. (2015), the Smartphone is used most frequently as most students have this device with them at all times. This can actually encourage students to be frequent users of social media. Students can access social media anywhere at any time with this device. Students also access social media frequently using laptops. Many schools provide laptops for students' use both in school and at home. With Internet access, students can utilize the laptop to access social media. Given the ease of accessibility of these devices, it is important for both teachers and parents to monitor the use of these devices and the information that students are accessing on the devices.

Frequency and parents monitoring social media use

With the increase of social media use by middle school students, it is important for parents to monitor the frequency of students' use of social media, the information they are accessing, and the friends with whom they associate. This study found that students used social media more than 10 times per day, specifically the girls used social media significantly more times than the boys. Students in our study express concerns for cyber bullying. Frequent monitoring of students' use of social media can provide parents with information regarding potential cyber bullying which can assist parents with early interventions before students begin to feel threatened or vulnerable. Parents can also monitor students' friends on social media and inquire about names they are not familiar with. This is extremely important to protect students from potential cyber stalkers and cyber bullying.

Age and befriending strangers on social media

About 17% of the students have started using social media at age 9 onwards. This study also found that girls started using social media earlier than boys. Accepting friend requests from strangers on social media can be a dangerous thing. About 40% of students, both male and female in our study reported that they have accepted friend requests from strangers. This can be dangerous for the safety of students. Many students accept friend requests to increase the number of friends that they have to boost their popularity on social media sites. Most do not understand the consequences that this behavior could have. This underscores the importance of having adults who continually monitor students' use of social media and the content of the information they are accessing.

Conclusion

Students are beginning to use social media at a very young age especially the girls creating social media earlier than boys and also befriending strangers more than boys. It is essential to educate the students, their teachers and parents on cyber bullying, digital identity, impact of digital footprints, and use of inappropriate social media. This study was conducted as a needs assessment to measure middle school student use of social media to develop a digital citizenship curriculum. The results of this study will benefit teachers, technology directors, parents, and school administrators to identify social media use among the middle school students. The results may also provide support to guide and inform instructional practices with the curriculum.

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