

Youth, Learning and Social Media in K-12 Education: The State of the Field

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Abstract: Prior reviews of social media in education found that most early research focused on college students. This review analyzes emerging research on social media with younger learners. Using PRISMA standards, we considered 1321 articles, selecting 48 reviewed here. We find that research on social media in K-12 learning is increasing rapidly, yet largely failing to study impacts on learning. Research is taking place across the globe on a variety of social media platforms, but the majority continues to look at the oldest K-12 learners. Few studies use control groups or comprehensively use analytic data collected by social media platforms. We highlight opportunities for scaling K-12 learning with social media globally and call for educators to engage more with social media developers and owners. With this overview, we offer an agenda for future learning sciences research, policy, practice and commercial development in this growing field.

Introduction

Educational researchers and professionals have theorized the potential of social media to transform learning in and out of classrooms (Greenhow & Askari, 2017; Manca & Ranieri, 2012). Educational design initiatives have shown that engineered Facebook applications can support knowledge building and discussion in informal (Greenhow, Gibbons and Menzer, 2015) and formal higher education settings (Tsovaltzi et al, 2014). However, we know very little about K-12 students' processes, perceptions and outcomes related to learning with these technologies. Unlike studies in the learning sciences that have focused on isolated technology-based learning environments, open social media spaces offer expanded vistas from which to study cultures of learning and teaching. For instance, online social networks introduce tools, people, and materials to school culture that could help to break up established routines and assist students in getting feedback on their performances (Greenhow, 2009). However, the field has struggled to understand the new cultures of learning arising in such "open environments" and connect them with educational practices.

In spite of their merits, social media are still largely perceived in the public discourse as platforms for social interaction devoid of learning (Whiting & Williams, 2013). Educational policies worldwide restrict their use, some even banning social media altogether, while others are vague and unhelpful. We propose a different approach – evidence based – focusing on the learner as a key factor in the effective use of social media-enabled learning environments. In this novel synthesis of over a decade of educational research, we present the state-of-the-field concerned with youth, learning and social media (2007-2017). This systematic literature review aims to provoke conversation on how learning scientists can advance timely, usable research that informs policy debates surrounding social media in K-12 education and the design of learning environments.

Social media, learning and youth

Social media, like social network sites (e.g., Facebook, Ning) and microblogging services (e.g., Twitter) include: 1) uniquely identifiable profiles that consist of user-supplied content and/or system-provided data; 2) (semi-) public display of connections that can be traversed by others; and 3) features that allow users to consume, produce, and/or interact with user-generated content provided by their connections (Ellison & Boyd, 2013, p. 7). Recent usage statistics in the U.S. indicate that Facebook dominates teenager's media practices; in 2014, 78% of youth aged 12-17 reported using Facebook (Elliott 2014). Learning applications and pedagogy that build on these routines may help bridge formal and informal learning by situating social learning opportunities within students' everyday online contexts and appropriating peer interactions on both curricular and extracurricular topics. The theoretical foundation of research on social media, learning and youth is unsettled, with scholars citing a wide range of explanations for how and why the learning occurs. Social learning theory as articulated by Vygotsky (1978) is one popular foundation of research in this emerging field. So is Gee (2015)'s affinity space theory, Jenkins' (2009) writings on participatory cultures, Wenger (1998)'s ideas about communities of practice and Seaman (2008)'s work on collectivism. Several studies included in this review are based on Ellison, Steinfield and Lampe (2007)'s work on social capital in digital spaces as well as Goffman (1959)'s theories about identity

formation. Scholars suggest that social media can facilitate learners' collaborative knowledge construction; accessing specialized just-in-time information, contributing to the hybridization of expertise; relational development and peer/alumni support especially in times of transition; academic help-seeking; social and civic benefits; and the blurring of boundaries between learning spaces, social spaces and leisure spaces (Manca & Ranieri 2013). Other scholars assert that these environments should be used for social reasons not for formal or informal learning (Crook, 2011; Selwyn, 2010).

To date, reviews of the educational research on learning and teaching with social media provide little guidance to teachers or designers on best practices for applying these technologies in K-12 education. Published literature reviews have focused mainly on the perceptions and experiences of college students (Aydin 2012; Manca & Ranieri 2013) and higher education faculty (Forkosh-Baruch & Hershovitz 2012). Moreover, the benefits of appropriating these technologies into learning contexts are contested in this research. Some studies suggest their affordances for interaction, collaboration, information and resource sharing (Maxman & Usluel 2010); encouraging participation and critical thinking (Mason & Rennie 2006; Ajjan & Hartshorne 2008); and increased peer support and communication about course content and assessment (DirVall & Kirwin 2012). Other researchers warned against exploiting social network sites for learning. Kirschner and Karpinski (2010), for instance, found that time spent on Facebook negatively affected college students' grades. The purpose of this systematic literature review is to assess the current state of educational research on K-12 youth, learning, and social media (2007-2017) to set a programmatic agenda for the future of learning sciences research in this area.

Connection to ICLS 2018 and partner conference themes

This literature review connects to the ICLS 2018 Conference theme by contributing to our understanding of the complexity of K-12 learners' processes, perceptions and concerns when social media, and designed applications, are embedded in different educational and cultural contexts. This research synthesis will also contribute to the knowledge base on how learning may be facilitated with existing social media platforms and designed applications.

Furthermore, this paper connects to themes of the Festival of Learning partner conferences: AEI (concerned with ubiquitous learning environments, informal learning, and social networks), Learning@Scale (concerned with opportunities to scale learning), and the development of commercial educational technology by advancing knowledge of the state-of-the field of youth, learning and social media research to foreground opportunities to design and study educational applications that run on global social networks, potentially leading to commercialization. Acknowledging that the most popular social media are owned by commercial companies, and are monetizing information collected from users, we offer ideas about how educators might engage more powerfully with these companies to shape the future of these important communication and education platforms.

Methods

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Standards guided the methodology for this literature review (Moher, et al., 2009). In consultation with a library science expert, the team identified four prominent databases for educational research: Education Full Text, ERIC, Scopus, and Web of Science. We performed database searches using the following terms: "(K-12 Teaching OR teacher training OR professional development OR elementary school or middle school or high school) AND (social media or social network sites or social networking sites or Facebook or Twitter or microblogging or Pinterest or Instagram) NOT (higher education)" finding 1268 articles. Note: this paper will address themes in the articles concerned with K-12 learners only and not themes in identified articles related to K-12 teachers and preservice teachers as this coding is still ongoing. The team reviewed each title and abstract, evaluating the relevance of each record. Criteria for an article's inclusion were: a focus on K-12 learning (e.g., students' learning in- or outside of school) and an inclusion of social media within our parameters (e.g. social networks, microblogs, collaboration tools, etc.). Articles were excluded if they were outside of K-12 education (e.g. nursing school, undergraduate education, etc.).

Furthermore, 100 journals publishing education or educational technology research were identified based on previous reviews (Manca & Ranieri, 2013). Any journals not covered in the database search underwent a manual table of contents search for the years available: *Journal of Literacy and Technology* (Dec. 2007 - Present), *Journal of Educational Technology Development and Exchange* (2011 - Present), and *International Journal of Online Pedagogy and Course Design* (2011 - Present). Two journals were unavailable online and, therefore, excluded: *International Journal of Continuing Education* and *Lifelong Learning and International Journal of Technology in Teaching and Learning*. We also scanned the bibliographies of articles deemed relevant. Through this process, we identified an additional 53 articles from other sources; we removed 8 duplicates, leaving a total of 93 articles.

Those 93 articles were then rated by three independent researchers based on the abstract and as needed, the full text. Any discrepancies between coders were discussed and resolved. This process led to the exclusion of 42 articles deemed not relevant, leaving a total of 50 relevant articles. Of these 50 articles, two were excluded because they could not be accessed. During the process, each researcher kept notes about search and relevance decisions, in keeping with the PRISMA standards.

The 48 full-text articles were then read and coded by the team and analyzed for themes. Based on previous literature reviews (e.g. Greenhow & Askari, 2017; Manda & Ranieri, 2013; 2016) five categories were identified as important to note in analysis: country context for the study; social media platform; age and/or grade level of participants; methodology; type of learning: formal, informal or other. Further, coders looked to the data to derive additional themes, allowing the data to suggest categories outside those established in the literature.

Findings

The overarching conclusion of this review is that research into uses of social media in K-12 education is rapidly increasing. Where earlier reviews of social media in learning found only a handful of studies with participants in the K-12 age range, this review identified 48 studies published in peer-reviewed journals, most within the last five years. Yet, within that sample, participants still skewed towards the older end of our age spectrum. Only six of the 48 studies in this review had elementary school aged participants (5-11 years old). Seventeen had participants of middle school age (12-15 years old) while 36 had participants of high school age (16-18 years old).

While Facebook remains the most prolifically studied social media platform (22 studies or 46%), the breadth of the literature is expanding. The next largest percentage of studies reflects this trend; ten (or 21%) were nonspecific in their research, collecting data on social networking sites in general rather than limiting findings to a particular platform. Sixteen different types of social media were represented in the articles; one was designed by Mallan, Singh, and Giardina (2010) specifically for their learners.

The diversity in social media studied is likely a result of the global interest in learning with social media. With 21 different countries represented in 48 articles, it is clear that the impacts of social media on K-12 learning is a worldwide concern. Furthermore, no single country has a monopoly on this work; the country where the most studies (10) were conducted, the United States, still accounts for less than 20% of the places researched. England, with eight studies, and China, with five, were the next most frequently represented countries in our dataset. Only one study (Lantz-Andersson, Vigmo & Bowen, 2013) compared social media use by K-12 students in different countries (i.e., in Colombia, Finland, Sweden and Taiwan).

Roughly equal numbers of studies focused on informal (19 studies) and formal (22 studies) learning contexts. Although definitions of informal and formal learning are contested in the research literature (Greenhow & Lewin, 2015), *informal learning* here refers to unconscious personal development (e.g. identity work) or conscious, but voluntary learning that is not a requirement of the classroom curriculum (Greenhow & Lewin, 2015). *Formal learning* may be driven by teaching objectives or curricula associated with K-12 schooling. Four studies straddled informal and informal learning, while three studies focused on describing student practices on social media that connected to learning without anchoring the study to any specific learning environment. For instance, Cook (2012) engaged hundreds of English high school students in focus group discussions of the differences in their social media practices in school and outside of school. Ma and Chan (2014) surveyed 299 Hong Kong high school students about their motivations for sharing content via social media, and Lee (2015) surveyed 720 middle and elementary students in Korea about negative behaviors on social media such as using improperly using digital content without the owner's consent.

In examining topics taught in classrooms where formal learning studies were conducted, the most common subject addressed was language arts, including writing and digital media, which served as the focus for 13 studies, explored below under the Media Literacy heading. Six studies focused on teaching study skills or collaboration within a formal classroom where other subjects of learning were not specified (Andersson, Hatakka, Grönlund & Wiklund, 2014; Fewkes & McCabe, 2012; Kio, 2016; Rosen, Carrier & Cheever, 2013; Vasbø, Silseth & Erstad, 2014; Vilca & Vallejos, 2015). Five studies analyzed social media use in science- or technology design-related classrooms (Huang, Wu, She & Lin, 2014; Lai et al., 2015; Reynolds & Chiu, 2016; Veira, Leacock & Warrican, 2014; Won, Evans, Carey, & Schnittka, 2015). As an example of the studies connecting social media learning to science learning in K12, Won, Evans, Carey, and Schnittka (2015) surveyed 44 students at a Virginia middle school, documenting the utility of Edmodo for supporting collaborative design process in an afterschool program, Studio STEM. Three studies took place in classrooms where English as a Second Language was taught (Lantz-Andersson, Vigmo & Bowen, 2013; Sun et al., 2017; Vikneswaran & Krish, 2016).

A strong preference for surveys emerged in methodology across the studies. A total of 26 studies (54.2%) used a survey. Thirteen studies (27%) used only surveys as their source of data, with eight focusing on informal learning and five divided between formal and informal learning.

The number of participants in the 48 studies in this review ranged from one, for a case study analyzing one English student's Bebo profile page (Dowdall, 2009), to 2611, for a survey of social media use by high school students in England and Wales (Luckin, et al., 2009). Fourteen studies, nearly 30% of the articles in this review, had 50 participants or fewer including five studies with ten participants or fewer. Twenty-seven studies, (56%) had more than 100 participants, including six with 500-1000 participants and three with more than 1,000 participants.

Twenty studies (or 41.7%) included some quantitative analysis of social media activity such as number of posts. An additional eight studies included observation of social media or implementation of social media as part of the procedures, making a total of 30 studies (62.5%) that directly engaged with social media. The other studies asked participants to describe experiences using social media to support student learning.

Only five studies (or 10.4%) used a control and treatment group design (Baris & Tosun, 2013; Cano, 2012; Ch., Mahmood, & Rasood, 2016; Lai et al., 2015; Sun et al., 2017).

Impact on learning outcomes

One of the most startling trends identified was the dearth of attempts to measure social media's impact on student learning. Only nine studies, including the five control and treatment design studies mentioned above, presented such findings. Baris and Tosun (2013); Cano (2012); Huang, Wu, She, and Win (2014); Lai et al. (2015); and Reynolds and Chiu (2016) all found content-specific grade improvements because of social media implementation. Sun et al. (2017)'s work with English as foreign language students found that social media is also effective in improving English language skills. In an interesting disagreement, Ch., Mahmood, and Rasood (2016) and Khan, Wohn, and Ellison (2014) found correlations between social media use and higher grades, while Rosen, Carrier, and Cheever (2013) found that social media use led to lower overall GPAs. Although the majority of studies reported success with social media in K-12 classrooms regardless of acknowledged challenges, these findings, in most studies, are not supported by data on changes in student learning connected to social media.

Social media and literacy

Throughout the literature, social media is seen as creating both a new path toward learning traditional language arts skills as well as a path toward gaining new digital skills – media literacy – that prepare students for the 21st century. Karal, Kocok, and Cakir (2015), for example, found that Facebook helped improve 30 Turkish high school students' writing skills, analyzing how their interactions and relationships between students themselves and between the teacher and students were essential to their growth. Li and Wu (2017) used a survey and focus group to study how 1,039 high school students in China practiced reading on WeChat, investigating their motivations through a cultural and social lens. Cano (2012) found that 280 high school students performed better on Spanish assessments after integrating Twitter into the curriculum.

Beyond bringing new perspectives and methods to traditional literacy skill sets, Reynolds and Chiu (2016)'s work with 242 middle and high school students suggests media literacy may help address the digital divide. The study's data comparing students' computer skills growth with the education levels of their parents showed that students whose parents had lower education levels improved more than those whose parents had higher levels of education after the implementation of the game-design social media, Globaloria. Although Lu, Hao, and Jing (2016) did not find a similar correlation between parent education level and student social media use in their survey of 186 Hong Kong high school students, these two studies may still be pointing towards the same finding: the potential for media literacy learning is not dependent on parent education level; media literacy programs in schools can create equal competence in students from varying backgrounds.

Luckin et al. (2009) explains that social media has the potential to be an asset in students' learning, but that a lack of the media skills required to complete complex tasks online is preventing effective application. Based on their case study of three 5th grade girls' usage of Reading Revolution, Lindstrom and Niederhauser (2016, p.116) build on the idea that students need a new skill set to be academically productive online: media literacy is "a new cultural form that builds on established rules and conventions, and is neither right nor wrong, but simply constitutes a new way to communicate."

Peer-to-peer learning and hybridized expertise

Social learning as an aspect of media literacy was highlighted in 13 studies, underlining the affordance of social media to continue peer-to-peer interaction and learning beyond specified school times and places. As one of these studies – Khan, Wohn and Ellison (2014, p. 139) – points out, "Evidence shows that the cognitive processes for deep learning and information retention processes occur in dialogs." In traditional educational setting, this discussion occurs in a classroom. Social media extends those conversations, which numerous studies found to be critical to learning, and which also mimic the kind of learning that occurs in many work situations the students

will encounter later in life. Khan, Wohn and Ellison (2014) collected survey responses from 690 US high school students, finding that Facebook enabled students to collaborate effectively on learning activities, including homework and resource-seeking.

Civic learning and engagement with the world outside of school

Three studies highlight the affordance of social media to connect learners with the world beyond the classroom. Beach and Doerr-Stevens (2011) used Ning as a platform for capturing the argumentative exchanges of 30 students in a U.S. high school participating in a virtual debate about school policies. The authors concluded that social media can be beneficial for forefronting competing opinions on an issue and encouraging response towards building collective understanding if not always agreement. Huang, Wu, She and Lin (2014) analyzed the Facebook posts of 83 Taiwanese high school students engaged in group conversation about science news as a tool for collectively developing understanding of the nature of science. Charitonos, Blake, Scanlon and Jones (2012) used Twitter to help 29 British 13- and 14-year-olds share ideas about artifacts explored on a field trip to The Museum of London.

Steps towards bringing social media learning to scale

Four studies reach toward developing tools that might be used to support learning by young people via social media at scale, envisioning replication in educational contexts around the world. Oussalah, Escallier and Daher (2016) is among them. The authors created an automated system for analyzing Twitter posts by 133 high school students in England. The system explored ways to assess the grammar used in these posts, and was supplemented by surveys asking students about their perception of the experiment. While the authors conclude that abbreviations and slang that are commonly used on Twitter create challenging obstacles for automated analysis of grammar, this study takes a step toward potential future development of similar tools that might be deployed with large numbers of learners.

In addition, the three studies looking at using social media to learn English as a Second Language offer potential guidance for developers thinking about using social media at global scale in K-12 learning. Given a British Council (2014) report declaring English to be the dominant global language with 1.5 billion learners studying English as a Second Language, and noting that “there appears to be a fast-moving worldwide shift, in non-anglophone countries, from English being taught as a foreign language (EFL) to English being the medium of instruction (EMI) for academic subjects such as science, mathematics, geography and medicine,” (Dearden, 2015, p. 4), these studies suggest how social media might be used to address the planet-wide market for English learning. Unlike many other subjects, English grammar and usage may be less negotiable and influenced local curricular preferences than some other subjects, and thus perhaps more suitable for learning at scale. Yet, we acknowledge that all languages evolve, and people learning English as a Second Language are participating in that process (Sockett & Toffoli, 2012). Studies with college students have found that social media is seen as a good place to learn English (Kabilan, Ahmad & Abidin, 2010; Yunus, Salehi, & Chenzi, 2012) -- a concept that could reach an even wider audience of informal English learners (Sockett & Toffoli, 2012). Turning to the k12 studies in this review focused on learning English as a Second Language, Vikneswaran and Krish (2016) examines the motivations of ten Chinese-speaking high school students in Malaysia who are asked by their new school to use Facebook to help them learn English. As Vikneswaran and Krish (2016, p.298) observes, “writing on social media platforms is generally informal, hence making it easier for users who are not very proficient in the English language to contribute their thoughts and ideas” without expectation of judgement, forefronting more intrinsic motivations related to learning and communication with peers. Lantz-Andersson, Vigmo and Bowen (2013) analyzed a closed Facebook group created for use by a total of 60 high school students studying English as a second language in Colombia, Finland, Sweden and Taiwan. The authors found promise for using Facebook as a medium for language learning across cultural context, noting, however, that such efforts must be “deliberately and dynamically negotiated by educators and students to form a new language-learning space with its own possibilities and constraints” (Lantz-Andersson, Vigmo & Bowen, 2013, p. 310). Sun et al. (2017) analyzed how 72 Chinese first graders studying English used Chinese-based social media platform focused on sharing photos and audio files, Papa. The authors found that students who communicated with each other in English by sharing recordings improved significantly more than a control group. This shows potential for using Papa and similar applications at scale, in other settings -- both formal and informal -- where English is not the native language.

Discussion and implications

Our findings suggest opportunities for research, facilitation of learning, education policy, and commercial development of educational technology, as discussed in these next sections.

Agenda for research

The field of research on social media in K-12 education is still young. We see numerous opportunities for future studies in with this population – particularly focusing on social media’s impact on learning outcomes. Additionally, more studies are needed with elementary school-aged participants, who are the least-studied age group in this review. Further, we hope to see more studies using data related to social media posts actually made by students, as opposed to more studies asking students how they use social media. Nevertheless, we see this data on actual posts as one component of potentially rich ethnographies of student social media use, which would be bolstered by student interviews exploring motivations and impacts related to social media usage. Noting that we reviewed only research published in English, yet observing that many of the studies in this review were conducted in countries where English is not the native language, we call for reviews similar to ours analyzing research printed in other languages – and ideally sharing that analysis with the English-speaking research community. Further, we see a need for more comparative studies looking at use social media use in K-12 learning in different language and culture contexts.

Facilitation of learning: implications for teaching practices

As many studies in this review point out, facilitating learning with social media in K-12 settings presents teaching challenges. Therefore, we offer three practical suggestions for K-12 teaching context. First, use social media to create a sense of community and a space to build relationships. Social media enables students to create a comfortable, supportive environment, where learning risks and identity development can be explored without fear of judgement (Eamer, Hughes & Morrison, 2014; Erjavec, 2013; Vikneswaran & Kirsh, 2016). Encouraging students to use social media as a way of blending identity and academic work allows students to have an authentic experience and reveals details of students’ learning practices that can inform teachers’ practices (Lindstrom & Niederhauser, 2016; Vasbø, Silseth & Erstad, 2014). Forkosh-Baruch, Hershkovitz, and Ang (2015) looked at differences between teachers and students who were and were not willing to connect on Facebook, and this theme of understanding the significance of the changing relationships that social media incurs is also emphasized in the work of Callaghan and Bower (2012) and Yang, Crook, and O'Malley (2014).

Second, teach students how to use social media for more than the transfer of information; integrate creative projects in which students are producing content. Given more training in advanced skills, social media does not need to be a distraction for students in the classroom; it can be a vehicle for discovery, constructivist learning, and imaginative thinking (Charitonos, Blake, Scanlon, & Jones, 2012; Fewkes & McCabe, 2012; Khan, Wohn, & Ellison, 2014; Lu, Hao, & Jing, 2016; Luckin et al, 2009; Ranieri & Bruni, 2014). Mallan, Singh, and Giardina (2010) called for more student involvement in teachers’ quests to understand the potential of technology in the classroom; youth adapt technology to their needs just as quickly as technology improves, and they can be a resource for discovering useful social media tools.

Third, maintain a strong teacher presence and accepting social media as an integral part of students’ lives. Andersson, Hatakka, Grönlund, and Wiklund (2014) proclaim that teachers need to “reclaim the students,” and rather than thinking of social media as a “beast,” teachers should embrace more structure and stricter management (p. 49, 47). Social media cannot be ignored in the classroom; it is a “hidden curriculum” fully integrated in youths’ learning whether teachers accept it or not (p. 22). Rosen, Carrier, and Cheever (2013) point to the impossibility of expecting students to disengage from their digital lives during class; students will always check their phones, or worry about checking their phones; instead of fighting a losing battle, consider options that ease students’ multitasking compulsion without detracting from learning such as offering “technology breaks” (p. 956). As Casey and Evans (2011) summarize, “Teachers cannot take this approach in fear of chaos and disorder; they must find innovative ways to *construct disorder* and *flow with chaos* and *build resilience* to the traditional training that instinctively drives them to take control” (emphasis added).

Implications for education policy

Our results suggest the need for shifts in education policy at all levels – school, district or region, state and national. If we acknowledge that K-12-aged students are growing up with social media as large component of global culture, then we need educational policies at all levels that support teachers’ use of these important communication platforms for learning. School-level policies that block access to social media sites should be reexamined. Curriculums that are silent on use of social media should be amended to include suggestions on how to use social media effectively. In addition, teachers should be offered guidance on how to manage their professional social media accounts in ways that will model good digital citizenship. When teachers observe misbehavior on social media, there should be policies in place to encourage resolution and turn these mis-steps into learning experiences. We note that while the tone of most studies in this review is positive, our search criteria eliminated studies focused on cyberbullying and social-media related depression, where these studies were not explicitly also connected to

learning. Nevertheless, some studies in this review noted learning-related downsides to social media use, such as inattention and lower grades. In this context, we wonder why educators are ceding control of data about how young people are using social media in education to the for-profit companies that create social networking platforms. The data collected by Facebook and other popular social networking sites on users – including our youngest students – is analyzed by Facebook and its competitors and sold to private data brokers for marketing purposes (Ramirez, Brill, Ohlhausen, Wright & McSweeney, 2014). As educators, we ask: why should we allow these companies to make money from our students' use of these important platforms of communication and literacy development? Why isn't it easy for researchers to get data about uses of social media in educational contexts? Since the Terms of Service created by these companies require users to give up much of the data about their use of these platforms for marketing purposes, why shouldn't these companies be compelled to share the data for research purposes as well? We note that Facebook Research partnered with researchers on several oft-cited studies with college student participants (Ellison, Steinfield & Lampe, 2007; Ellison, Steinfield & Lampe, 2011). That work and other studies conducted with college students should be extended to younger students, especially since developmental theory suggests that early adolescence is a time when friendships and related social capital are intensely important (Berndt, 1982). We are eager to see collaborations between social media companies and researchers working in K-12 education contexts. Under U.S. law, major social media companies are allowed to design for users who are 13 or older, so there should be no legal restraints to conducting large-scale research on social media with US students in middle school and high school. We call for policies at all levels of education pushing for greater access for researchers to data collected by social media platforms that may be owned by large for-profit corporations, yet are increasingly used as essential tools in public education. By blocking researcher access to this data, school policies are not protecting students' privacy. Instead, such policies merely ensure that only the for-profit companies that own the major social media platforms are seeing this data.

Implications for the commercial development of educational technology

Companies such as Facebook and Twitter are powerful enough to compare their executives to global political leaders. These companies profit from selling the data they collect about all their users, including students and teachers, to companies that want these users to buy commercial products and services. Social media companies, notably Facebook, have been widely criticized for designing algorithms to manipulate user's emotions to provoke engagement with paid content. Yet it is possible to envision newer, innovative platforms replacing or remaking these iconic social media brands. In this discussion of future developments of social media in education, we draw attention to the ideas of the high school student participants studied by Bowler, Knobel and Mattern (2015, p. 1274), who suggested that in the future social media developers should “design for hesitation, design for consequence, design for empathy, design for personal empowerment, design for fear, design for attention, and design for control and suppression.” For example, social media could employ more “undo” buttons, giving users the ability to edit or even erase social media activity over a longer period of time. Social media could use algorithms to connect people who might be impacted by the topic of a post with people who are discussing that topic from a distance on social media. We think such features would enhance learning opportunities with social media in K-12. We hope that the public-interest perspectives of K-12 students and teachers -- and the researchers who study them -- will help develop the next generation of social media.

Endnotes

(1) Authors contributed equally and are listed alphabetically

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Due to space constraints please find the full Reference List here: <http://bit.ly/youthlearningsocialmedia>

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