PSYCHOLOGICAL, SOCIAL, AND EDUCATIONAL DYNAMICS OF ADOLESCENTS' ONLINE SOCIAL NETWORKING

Christine Greenhow, Michigan State University, greenhow@msu.edu
Benjamin Gleason, Michigan State University, gleaso77@msu.edu
Jiahang Li, Michigan State University, jiahang@msu.edu

Abstract italiano

I social media rendono i ragazzi più intelligenti? La risposta a questa domanda ha suscitato un ampio dibattito educativo in tutto il mondo. Tuttavia, finora la ricerca si è occupata poco dell'uso dei social media tra gli studenti nei contesti di apprendimento formale pre-college. In questo articolo esploreremo le dinamiche psicologiche, sociali ed educative di una delle attività con i social media dominanti tra gli adolescenti (12-17 anni): la costruzione della loro rete sociale nei siti di social network. Concluderemo con alcune indicazioni sulla progettazione di applicazioni orientate all'apprendimento.

Parole chiave

Social media, siti di social network, ricerca educativa, adolescenti

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English Abstract

Is social media making kids smarter? The answer to this question has sparked a debate in education around the world. However, research to date has narrowly focused on social media use among pre-college-age learners in formal educational settings. In this article, we explore the psychological, social and educational dynamics of one dominant social media activity among adolescents (ages 12-17): their online social networking in social network sites. We conclude with opportunities for designing education-oriented applications.

Keywords

Social media, social network sites, educational research, adolescents

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1. Introduction

Is social media making kids smarter? The answer to this question has sparked a debate in education around the world. A central problem on both sides of the argument is the implicit assumption that all social media - a term often used interchangeably with Web 2.0 to refer to online applications which promote users, their interconnections, and user-generated content - are more or less equivalent. In fact, social media facilitate a range of practices: video-conferencing, collaborative authoring, messaging friends of friends, engaging in online chat, sharing images and others. As Steinkuehler and Williams (2006, p. 886) point out:

> «It would be more plausible and empirically rigorous, then, to consider how specific forms of Internet activity impact [...] engagement as a result of their particular underlying social architecture [...] their designed-in, code-based structures that afford some forms of interaction and constrain others».

Therefore, in this article, we bound ourselves to exploring the psychological, social and educational dynamics of one dominant social media activity among adolescents (ages 12-17): their online social networking in social network sites (SNS). Young people use SNS (e.g., Facebook) for a wide-range of purposes, some of which are educational. For instance, Selwyn (2009) describes students' education-related uses of the social network site, Facebook, including: critiquing learning experiences and events, exchanging logistical or factual information about teaching and assessment requirements, and instances of supplication and moral support related to assessment or learning.

Although existing SNS like Facebook can be integrated into educational practices in a range of learning settings, educational research has focused mainly on their use by college students within a particular course, and much less on their uses for informal learning or learning among teens (Greenhow & Gleason, 2012; Manca & Ranieri, 2013). Moreover, studies in higher education have cautioned against harnessing SNS like Facebook for education. Kirschner and Karpinski (2010), for instance, found a negative relationship between time spent on Facebook and college students' grades. Junco and Cotton (2013) warned that 'Facebook-ing' places great demands on some students' multitasking, especially that of younger college-age learners. Other research suggests that how Facebook is used makes a difference in whether academic outcomes are positive or negative (Junco, 2012). For example, posting status updates and chatting on Facebook were negatively predictive of grade point average (GPA), while checking status updates and sharing links were positively predictive.

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While such reports on the psychological, social and educational dynamics of college students' social networking reveal complex and contradictory findings, we know even less about these dynamics when pre-college age learners are involved. Therefore, we focus our attention here on the recent empirical literature involving adolescents, and the psychological, social and educational dynamics of their activities in social network sites. We present a select review of the empirical research literature on online social networking in pre-college years and the reported benefits and challenges these students experience in using SNS as a learning tool. We then use these insights to suggest recommendations for the design of SNS as platforms for learning or the design of specialized learning applications. To help orient the reader, we first provide a brief definition of SNS: their distinguishing features and their common uses and purposes, as the specific form of Internet activity that bounds our exploration.

2. Social Network Sites: A Definition

Social network sites (SNS) are a form of social media defined by the following socio-technical features:

> «1. [...] *uniquely identifiable profiles* that consist of user-supplied content, content provided by other users, and/or system-level data; 2. [...] *publicly articulate connections* that can be viewed and traversed by others; and 3. [...] [features that allow users to] consume, produce, and/or interact with *streams of user-generated content* provided by their connections on the site» (Ellison & boyd, 2013, p. 158).

The most popular example worldwide is Facebook, but other SNS have also been adopted in certain regions such as V Kontakte in Russia, QQZone in China, Netlog in Belgium, and Cloob in Iran.

Some argue that SNS are used predominantly to connect with those one already knows and less for traditional 'networking' purposes (boyd & Ellison, 2007). Others prefer the term social networking sites and point to sites such as LinkedIn (www.linkedin.com), which are used primarily for networking or building one's list of personal contacts. We use these terms interchangeably and define social network sites as Web-based services through which individuals can maintain existing ties and develop new social ties with people outside their network (Greenhow, 2011b).

As Facebook - the world's largest social network with 1.23 billion active users (Smith, 2014) - is an integral part of high school students' routines, learning applications that exploit these routines may help students bridge formal and informal learning by situating social learning opportunities within their everyday social contexts and appropriating peer interactions on both curricular and extra-curricular topics. As such, Facebook is

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attracting interest from educators and learning scientists as a potential platform for online and collaborative learning, and identity development (Greenhow & Li, 2013; Greenhow et al., 2014; Greenhow et al., 2009).

Contrary to recent reports that teen's interest in SNS like Facebook is waning (Matyszczyk, 2013; Meyer, 2014; Miller, 2013), recent usage statistics, in the United States at least, indicate that Facebook still dominates teens media practices. For example, in 2012, 77% of young people aged 12-17 reported using it (Lenhart, 2012), while in 2014 that figure increased to 78% (Elliott, 2014). Young people use SNS like Facebook for a range of purposes. According to a recent report (Madden et al., 2013), a high percentage of US teenagers (91%) use SNS such as Facebook to post pictures, while 84% use the platform to share interests such as music, movies, or books they like. In addition, almost one-quarter of US teens post videos of themselves. The average teenager (ages 13-17) on Facebook has around 300 Friends, which overlaps with his or her offline social network. These social connections contribute to positive experiences for young people. Almost 60% of teens reported they had an experience online that made them feel good, and almost 40% of teenagers had an experience that made them feel closer to another person. And while there is strong evidence (Greenhow & Burton, 2011) that suggest that Facebook can support the development of valuable social resources for teens, research on the uses of SNS to support teaching and learning have been less frequent.

3. Adolescent Learners, Learning, and Social Network Sites

To identify empirical articles that examined adolescents, learning, and SNSs, in June 2014 we scanned the table of contents of three prominent technology and education journals (i.e., Computers & Education, Journal of Computer Assisted Learning, British Journal of Educational Technology), indexed in the Web of Science Journal Citation reports, over a five year period (2010-2014); identified additional published work cited in these papers; consulted two known literature reviews published in highly regarded educational research journals (Aydin, 2012; Manca & Ranieri, 2013); and scanned four prominent databases (ERIC, Education Full Text, SCOPUS, and Web of Science) for additional relevant educational research. Below we present a select review of the educational research relevant to our topic in this paper.

3.1. Adolescent learners' belief, practices, and outcomes

Although the research related to adolescent learners' practices, preferences and outcomes in SNSs is still in its beginning stages, a handful

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of studies (see below for references) suggest that contexts such as Facebook can be: 1. naturally occurring, youth-initiated spaces for informal learning, or 2. harnessed as environments that support learning in formal settings, or 3. a platform for designed environments (e.g., educational Facebook applications) that help youth be more civically and academically engaged. We present studies of adolescent learners experiencing each of these contexts.

3.1.1. Youth-initiated spaces for informal learning

Only a few studies have found that adolescent learners, outside of a formalized class, curriculum or youth development program, used (or believed they could use) their existing online socializing practices in SNS for learning functions in direct and indirect support of education-related tasks (Erjavec, 2013; Greenhow & Robelia, 2009a; 2009b; Mao, 2014; Weeden et al., 2013). For instance, Greenhow and Robelia (2009a; 2009b) examined the online social networking practices of high school students (ages 16-18) from low-income families and found that their social networking in MySpace fulfilled important social learning functions. These social learning functions included: 1. obtaining recognition for and appreciation of creative work through feedback on their profile pages; 2. reaching out to former classmates to give or receive help in managing the ups and downs of high school or college life, or even direct help with school-related tasks; 3. engaging in digital literacy skills; and 4. performing identity work.

Similarly, Mao (2014) found that adolescents, aged 14-17, generally spend a lot of time on social media and have positive notions that social media can support teaching and learning. The students in this study noted that social media supports interactive, engaging, and fun learning. Students reported that they can obtain instantaneous help with homework by posting a question to peers (including those with more knowledge) through SNS. The author reported that social media enabled young people to connect formal learning opportunities with informal ones, such as using Facebook to plan and organize student government functions.

In a study of Slovenian primary school students (ages 13-14), Erjavec (2013) found that many students use Facebook for informal learning, such as a space to learn about technology, as a social support, and as a venue for organizing. Students reported using Facebook for social support, especially around school assignments. Some students noted the use of the social network as a way to communicate with teachers, others reported organizing group projects through the site, while some students discussed how their Facebook use brought them emotional support.

One study (Weeden et al., 2013) found that students' interest in online social networking begins in the pre-teen years and increases over time and that teens' actual social networking activities, such as asking for help, were positive and conducive to informal learning. The authors surveyed

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199 elementary students in grade 3 to 6 (age 7-12) in the midwestern United States and found that most students were interested in joining SNS. They also identified an increasing trend of interest in participating in SNS beginning at age 9 that grew at a rate of 20% a year, until almost all students claimed that they subscribed to Facebook by age 12. All but one 11-year-old boy reported that at least one parent or a family member was aware of their participation in SNS. Regarding the activities in SNS, most students used SNS for positive activities such as complimenting friends, asking for help, while 8% reported exposure to unkind comments. The authors suggested that online safety needed to be introduced in curriculum, even to parents, since almost 25% of the students were not aware of the importance of this issue.

3.1.2. Environments that support learning in formal settings

Unlike the range of studies conducted with college-age learners in higher education settings, studies of adolescent learning with SNS in formal classroom environments and tied to formal curriculum objectives are still extremely rare in the educational research literature as are studies of middle or high school teachers harnessing SNS environments to support learning and teaching. However, one exploratory case study (Lantz-Andersson et al., 2013) examined how students frame their interaction in SNSs in school practices and what this framing implies for educational language teaching and learning practices. Students (age 13-16) were asked to join a Facebook group created by the researchers and provide their thoughts on discussion topics that the researchers assigned. Based on ethnographic data collected from a Facebook group in English-learning classes with 60 students from Colombia, Finland, Sweden and Taiwan, the authors identified possible extended spaces for the generation of collaborative language-learning activities. In these spaces, students combined their formal language learning in schools and their communicative use of language in daily life.

However, the authors argued that it was difficult to maintain those spaces due to the boundary crossing between formal schooling and informal learning that students must navigate. At the beginning of the study period, students tended to frame the Facebook group activity as a formal school task. As the interaction in the Facebook group evolved, students started to challenge the norms of schooling in a collaborative way (by using more digital, vernacular language). Students reframed the Facebook group as a virtual space for communication and interaction, different from their initial individualized perspective where they just finished a 'school' task and wrote texts to introduce themselves. The authors also identified discontinuity in their interactions and believed that the extended spaces, facilitated through Facebook, required negotiations of meaning between teachers and student-users. On one hand, teachers needed to develop and manage the language learning activity in the

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Facebook group to make their expectations clear; on the other hand, students had to re-frame their roles and representations in the Facebook group across the formal and informal learning boundary. The authors suggested that for adolescents to navigate between their Facebook-ing for socializing and informal learning, and their Facebook-ing for more formalized language learning, they needed to adjust to new roles regarding various communicative and linguistic repertoires in order to be successful in these extended spaces.

3.1.3. Platforms for designed educational technologies

Despite the potential of SNS like Facebook to serve as a platform for designed learning environments (e.g., educational applications; Greenhow, 2010; 2011a), we identified only two published studies from a research project lead by the first author that exploited this potential (Greenhow et al., 2014; Robelia et al., 2011). Robelia and colleagues (2011) examined a Facebook application called Hot Dish, designed by a research and development team lead by the second author to engage high school and college-age learners in debating environmental science issues (for a more complete overview of the Hot Dish application, including its key features and uses, see Greenhow, 2010; 2011a). The Facebook application also posed over fifty problem-solving challenges, designed to foster environmentalism and motivate young people to take 'eco-friendly' actions in their local communities. The researchers found that adolescent users of the Facebook application reported above average knowledge of climate change science and increased pro-environmental behaviors because of peer role modeling on the site. A post-survey revealed that young people were motivated to participate in the Hot Dish application, rather than other online spaces available to them, because they perceived the application within Facebook as an environment with which they were already familiar. They also perceived the Hot Dish community as place for like-minded peers, making them more likely to share their ideas, opinions, and activities related to their interest in environmental science and climate change.

Moreover, Greenhow et al. (2014) examined peer argumentation in this same Facebook application, Hot Dish. The researchers analyzed over 950 online comment strings made in response to environmental science-related articles, posted by adolescent users or an editorial team. They found that comments were epistemic, or on-task, rather than merely social talk un-related to the article under consideration, and that argumentation structures (e.g., with claims, warrants, grounds, and counterarguments) were present in these comment strings. Argumentation, although difficult to facilitate in already time-strapped classroom-based learning environments or in other online environments, has been shown to help students build their competence in modern scientific literacy. Thus, designing informal, interest-driven learning environments (e.g., online

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applications) around niche topics (e.g., environmental science and environmentalism) within the everyday online contexts students already frequent (e.g., Facebook) may offer educational opportunities for building on, extending or connecting students' out-of-school interests with formal learning objectives.

3.2. Opportunities: designing education-related SNS

Overall, these studies on adolescent learners' beliefs about informal or formal learning practices within SNSs suggest important design considerations for media educators, educational technologist and researchers interested in creating and evaluating SNS or designed social networking applications for education. These studies argue for teaching and learning that reflects many of the features of social network spaces: they are fun, participatory, and invite connection and communication between learners. These studies also demonstrate the centrality of SNS in young people's lives, blurring boundaries between online and offline, in-school and out-of school, social and academic.

First, adolescents want any teaching and learning environment to be engaging ('fun'). While students in Erjavec (2013)'s study reported that school is 'serious', they perceived social media as encouraging a relaxed atmosphere, which could help build connection between the social and the serious. Second, young people noted their desire to be able to access social support throughout their daily life. Greenhow and Robelia (2009b) and Mao (2014) reported that some students used Facebook to receive homework help, while others (Erjavec, 2013; Greenhow & Robelia, 2009b) claimed that young people sometimes wanted emotional support for the stresses of school. In these ways, SNS such as Facebook can help address the diverse needs, including social and emotional needs, related to or outside of the formal academic curriculum. Designs that help adolescents access these sites on-the-go and on-demand, such as through portable, hand-held applications as well as traditional laptop or desktop computer-based applications, align well with these preferences.

Furthermore, adolescent learners were vocal about the disconnect between how they use Facebook in their out-of-school lives - to share pictures, to tell a story, often with friends, and to give and receive support - and how they use Facebook in their school lives (e.g., mainly to turn in school assignments) (Mao, 2014). Teenagers' responses indicated a sophisticated understanding of the participatory, interactive nature of social media uses that typically overshadow their limited application in school contexts. From these findings, we might infer that adolescent learners do not just want to use Facebook to turn in assignments and check grades, for example. They are excited to use the space to connect through multimedia sharing, story-telling, peer support (e.g., Like) and other features that distinguish SNS from online learning management

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systems and other online spaces. They are excited to use the space to connect with content area experts (such as historians who can contribute to a discussion on the Holocaust, for example). Young people also indicated the value of creating engaging multimodal artifacts (such as videos) that offer new educative opportunities. They want more interaction with teachers, not less, suggesting a desire for structured interaction with a trusted mentor teacher (even in spite of restrictive policies that typically limit social media use in schools, and/or student-teacher interaction).

Erjavec (2013) noted that adolescent Facebook users acknowledged the connection between their SNS use and their learning; in fact, young people indicated they used Facebook for school, but also for 'school-related' issues. Thus, it seems clear that young people are interested in using Facebook as a site not only of active teaching and learning (to connect with subject matter experts, to create and watch videos, and to share useful learning resources), but as a way to build social relationships between all learners (including the teacher). They do not want, in short, Facebook to be a one-way exchange for dull administrative work.

3.3. Challenges: designing education-related SNS

In contrast to opportunities for designing learning environments suggested by the aforementioned research, other research helps us understand the pitfalls or challenges media educators, educational technology designers, and other educators may encounter (Christofides et al., 2012; Couros, 2008; Davis & James, 2013; Junco, 2012; Read et al., 2012; Rosen et al., 2013; Vanderhoven et al., 2013; Weeden et al., 2013).

Research has suggested that the design of SNS, while certainly engaging and gratifying, may present difficulties for adolescents, including a tendency to distraction, and complex privacy-related knowledge. That is to say, that participation in SNS brings with it potential risks and possible harm, in addition to the aforementioned benefits.

First, although research has shown that taking frequent breaks is essential to increasing productivity, some students may be more adept at staying on-task with respect to their school work and managing their task-switching effectively in social-mediated environments than others. Thus, designers must consider which SNS features are most essential for their purposes and which are potentially distracting and non-essential (e.g., Facebook chat) (Junco, 2012; Rosen et al., 2013).

For instance, Rosen and colleagues (2013) observed 263 middle school, high school and university students studying for 15 minutes in their homes. They noted the technologies present and computer windows open in the learning environment prior to studying; they conducted a minute-by-minute assessment of on-task behavior, off-task technology use and open computer windows during studying. A questionnaire was

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administered to explore students' study strategies, task-switching preferences, technology attitudes, media usage, monthly texting and phone calling, social networking use and GPA. The authors claimed that, on average, students could only be on task for less than six minutes. Students often went off-task because of social media, texting and their preference for task-switching. Moreover, results indicated that having a positive attitude toward technology did not affect being on-task during studying. However, those who preferred to task-switch had more distracting technologies available and were more likely to be off-task than others. Also, those who accessed Facebook had lower GPAs than those who avoided it. Finally, students with relatively high use of study strategies were more likely to stay on-task than other students. The authors suggested that short 'technology breaks' might be useful for students to keep their focus and increase the on-task time.

Second, research on adolescent learners' beliefs, practices, and outcomes in SNS suggests that privacy – adolescents' understanding and managing of it as well as concerns about it – is a challenging issue that media educators, educational technology designers and teachers must take into account (i.e., boyd, 2014). For instance, Davis and James (2013) explored early adolescents' (age 10-14) notions of privacy in an increasingly digital world and found that they do, in fact, value it. In addition to wanting to maintain their privacy online from unknown others (e.g., 'stranger danger'), almost 80% of young people reported they wanted privacy from a friend, family member, or acquaintance. Young people noted a number of proactive strategies designed to afford them online privacy. These included withholding information (such as not disclosing their full name, address, or contact information), adjusting privacy settings (limiting online access to 'friends only', for example), and requesting advice on privacy matters from friends, parents, or teachers.

Similarly, Read and colleagues (2012) conducted a qualitative study of 21 seniors in an upper-middle-class suburban high school. By analyzing individual and group interviews, the authors found that these students' Facebook uses were significantly diverse. Students' Facebook friends groups ranged from 50 to 3700. They tended to use Facebook's status update, wall posts and chat features most frequently. Also, students mainly add friends in Facebook from their face-to-face connections. Students adjusted their privacy through privacy settings as they negotiated between identity protection and self-disclosure, which suggested that they knew the potential risks associated with SNS use and sought to protect their privacy accordingly.

Another challenges for designers and educators is that unlike students in the studies above, many teenage students (25% of participants in one study) may be wholly unconcerned with or unaware of online safety or privacy issues (Weeden et al., 2013).

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For instance, in a study that examined adolescents' ideas about the importance of online privacy, Vanderhoven and colleagues (2013) found that adolescents aged 13-14 reported being generally unconcerned with privacy-related issues. While this lack of concern about privacy may be due to a variety of factors, including low technical competence, social pressure to engage in possibly risky online behavior, or lack of social network site knowledge, the authors reported that training in the school can reinforce important privacy related behaviors.

Similarly, Christofides and colleagues (2012) found that adolescent Facebook users who suffered a negative experience on the site - the most common ones were bullying, unwanted contact, and unintentional disclosure - often increased their privacy-related behavior. As a result of these negative experiences, students (aged 12-18) reported that they responded by strengthening their privacy controls. This study suggests to designers and educators the importance of explicit instruction around privacy-related issues. Vanderhoven and colleagues (2013) and Christofides and colleagues (2012) argue for the importance of direct instruction (from teachers, parents, peers, and even Facebook itself) about how to maintain privacy controls.

Furthermore, Couros (2008) issued important recommendations on how to maintain a safe classroom environment for all learners when SNS are used. Couros argued for using private social networks like Ning that allow educators greater control over learner activities or communication. Ning, the author suggested, is a more appropriate option for students, especially younger learners who may have less knowledge about important privacy-related issues, such as self-disclosure, the possibility of having negative experiences, and unwanted contact with others.

4. Implications for Social Mediated Learning Environments and Instructional Design

Research on how adolescents aged 12-17 use of SNS for formal and informal learning purposes suggest a number of important implications for educators, designers and teacher education. First, research highlights the importance of considering and building on adolescents' values and prior experiences of online social networking in designing social-mediated spaces for learning. Teachers and researchers should understand that many young people are excited about using SNS for teaching and learning, and several reviewed studies document the potential of SNS as learning spaces that invite participation, communication, and connection. Indeed, research suggests a connection between out-of-school activity and in-school activities as many young people give and receive social support through the use of SNS (Erjavec, 2013; Greenhow & Robelia, 2009a;

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2009b). Such research suggests that integrating SNS into the formal curriculum could bring a number of advantages, including increasing engagement, using the platform to organize academic and extracurricular activities, and facilitating social supports for school-related tasks and activities (Greenhow et al., 2014; Robelia et al., 2011).

Second, the reviewed research suggests the complexity and range of teens' expectations about privacy while reminding adults that privacy may mean putting more controls in students' hands and educating them about ways of using it. Davis and James (2013), Christofides and collegaues (2013), and Vanderhoven and colleagues (2013) demonstrate the necessity of educating young people about privacy before they have a negative experience (which exposes them to unnecessary risk). While many adolescents noted that they use a variety of strategies to maintain control over their social media use, others do not well understand or have well developed privacy strategies (Davis & James, 2013). Teachers and instructional technology designers seeking to incorporate SNS into formal learning environments or develop social networking applications for learning can and should play a role in providing privacy control options and helping students understand the trade-offs of different strategies. Online safety issue may need to be included into the instruction (Weeden et al., 2013). When implementing learning activities in SNS environment, a clear and guided safety instructional lesson could be developed either embedded into the SNS (i.e., video clips) or taught prior to the actual use of SNS.

Third, this review suggests that educators and students may have to re-negotiate their roles where social network sites or social networking applications intersect with classrooms and curriculum. Creating an extended informal-formal space is essential to successfully combining learning activities and students' informal online social networking. However, it requires teachers and students to negotiate new roles and expectations in such spaces (Lantz-Andersson et al., 2013). For instance, the traditional hierarchy where the teacher's authority and content-expertise are central to classroom management must be re-negotiated to facilitate student-generated content, informal socializing, multi-media authoring, and identity construction, all of which are distinguishing features and values in online social networking.

Finally, the lack of published research documenting students' (ages 12-17) learning experiences in social network sites or in designed educational social networking applications suggests the need for ongoing research and evaluation to accompany social mediated- or instructional designs. Efforts to address persistent teaching problems, curriculum goals, or students' needs, preferences and interests using this social media should be accompanied by research and evaluation efforts that monitor learning and teaching processes over time. Conducting rigorous qualitative research,

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including talk- or think-alouds with students' and teachers, would help the field assess whether and how students are using existing SNS features or a social networking application as it was designed to be used and where designs can be improved based on learners' and teachers' input (Greenhow & Gleason, 2014). Moreover, research involving young people (ages 12-17) should also address the experiences and learning of educators or youth workers who facilitate the integration of SNS (Greenhow et al., 2009). Specifically, how do these adults use this social media in their personal and professional lives, with what benefits, challenges, and concerns, and how do they and their students engage in role negotiation, with what outcomes? Addressing these questions, research could help inform the design of social-mediated environments for both adolescent and adult learners.

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