



Consuming, sharing, and creating content: How young students use new social media in and outside school



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ABSTRACT

This survey study investigated 186 secondary 2–5 school students from two schools to understand how and why they used new social media both in and outside of school to consume, share, and create content. It found that whereas students tend to consume and share more social media content outside of school they create more in school. Perceived importance of sharing content with peers or others is the most significant predictor having positive impact on all social media activities, both in and outside school. However, the negative impact of self-regulation ability on outside school social media activities implies the conscientiousness of their social media engagement, which calls for a further investigation on the quality of the social media content.

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1. Introduction

New social media refers to “the set of new media that enable social interaction between participants, often through sharing” (Ito et al., 2009, p.28). In contrast to predefined technology-rich learning environments, the availability of new social media provides resources and contexts that allow for a larger degree of freedom and autonomy for self-directed learning and exploration. Therefore, an explosive growth has been witnessed in creative activities by students on new social media networks (National School Boards Association, 2007).

A fine-grained understanding of how most students use social media is critical for schools to develop effective facilitating strategies for social media use. While many studies have explored duration, locations, application types of social media usage (e.g., Bennett, Bishop, Dalgarno, Waycott, & Kennedy, 2012; Correa, Hinsley, & De Zuniga, 2010; Eyyam, Menevi, & Dogruer, 2011; Junco, Heiberger, & Loken, 2011; Luckin et al., 2009; Mao, 2014),

few have characterized and compared different dimensions of social media behavior among youth. This study seeks to fill this research gap by focusing on how students consume, share, and create social media content and the factors impacting their social media activities.

Given its fast Internet speeds, high penetration rates of household broadband, easy access to personal computers, and the highest rate of mobile internet usage in Asia (GO-Global, 2015), the use of social media in Hong Kong is more widespread than in many other Asian countries. By 2016, the total number of Internet users in Hong Kong reached 5.44 million, around 71% of its total population (Internet World Stats Data, 2014), and the penetration rate of social media is up to 64% of its population (GO-Global, 2015). With easy access to social media in daily life, students are learning how to use these resources and tools at an earlier age. A 2010 survey (Public Opinion Programme of the University of Hong Kong) found that 12–15 year-old and 16–19 year-old teens spent an average of 13.3 and 19.9 h per week respectively on Internet and social networking websites. In a socio-cultural atmosphere characterized by intense academic pressure, it is important to understand how and why they spend so much time on social media. This study will address this issue by examining the social media use of Hong Kong secondary students both in and outside of school.

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2. Background

2.1. The social media use

2.1.1. Using social media for content consuming and sharing

Social media tools, such as Blogger, Facebook, and YouTube, make it easier for students to express their thoughts, share their experiences, and present their views (Lenhart, Purcell, Smith, & Zickuhr, 2010). In a recent U.S. census based on a large national sample, more than 45% of the teens said that they frequently use social media; the average time the teens spent on screen media was around 4 h per day, and for 39% of them, it is up to 6 h on a given day (Rideout, 2015).

Teens are more inclined to watch streamed video and read blogs than adults. On an individual level, social media gives them more opportunities to have social interactions with others and to enrich their learning experiences. As teens primarily read blogs from people they know, this activity can maintain and extend their interpersonal relationships (Lenhart & Madden, 2007). In a recent study by Jaffar (2012), 98% of students were found to use videos on Youtube in their learning, and 92% of them claimed that the videos were helpful to their learning. On the next level of information sharing, social media provided a channel for students to share useful contents and interesting ideas. Lenhart and Madden (2007) reported that about 40% of teens tended to share information online, including artworks, photos, stories and videos. Thus, it is through sharing information on social media that students become active co-producers of knowledge as opposed to passive consumers of information (Al-rahmi, Othman & Musa, 2014).

2.1.2. Using social media for content creating

Given that most recently created jobs involve collaborative content-creation (Discipio, 2008) they call for workers who are equipped with such highly valued 21st-century skills, as critical thinking and communication. Emerging social media networks, such as email, wikis, and blogs, are arena where young people can collaboratively design, create, and poste their own material. These social media provide young people with opportunities to easily transform themselves from online information consumers to active content creators. Lenhart and Madden (2007) reported that more than 60% of U.S. teens engaged in some types of content creation activities, such as writing blogs, developing websites, and smashing online contents into new creations. Content creators were also found to engage in more communication activities than non-content-creators. This suggests that content creation may involves more social interaction, and may help with teen's social development (Lenhart & Madden, 2007). While many published studies have focused on the social use of technology in young people's content creation on social media (Chiu, Ip, & Silverman, 2012; Lenhart & Madden, 2007; OECD/CERI, 2008), few studies examined the extent to which young students in Hong Kong engage in content creation activities, and the factors influencing such activities.

2.1.3. Using social media in and outside school

For the past two decades, Internet-based classroom innovation has been the ever-lasting topic in school education and public policy making, even though doubt has been casted recently on its effect on student academic performance (Carter, Greenberg, & Walker, 2016). The increasing accessibility and affordability of Information Communication Technology (ICT) has significantly narrowed the 'digital divide' among students from different socioeconomic statuses (Bingimlas, 2009; Kerawalla & Crook, 2002; Webb, 2005). Therefore, societal concerns have gradually shifted from the availability of ICT to how it supports students'

learning (Al-rahmi & Othman, 2013; Dabbagh & Reo, 2010; Mack, Behler, Roberts, & Rimland, 2007; Madge, Meek, Wellens, & Hooley, 2009). Given the ability of social media to facilitate communication and collaboration among peers and instructors, the integration of social media into school education has become a global research trend (e.g., Al-rahmi et al., 2014; Bull et al., 2008; Collins & Hide, 2010; Kear, 2011; Leask, 2004; Rowlands, Nicholas, Russell, Canty, & Watkinson, 2011; Smith & Caruso, 2010). In Hong Kong, while schools are well-equipped with ICT infrastructures, the use of social media in teaching and learning remains somewhat limited. Most ICT-supported learning activities take less than 10% of class time, and learning activities involving the use of high-level social media, such as content creation, are even quite rare (CITE, 2015).

The use of social media in and outside of school may differ substantially, because school and home environments are composed of distinct ecologies with different culture (Stephen, McPake, Plowman, & Berch-Heyman, 2008; Stevenson, 2011). When students are at home, they not only use social media more actively but they use more diverse forms of social media than when they are at school. According to a 2014 national survey conducted in China, up to 80% of students' online time was spent at home (CICET & BNU, 2014). Whereas, how students spend their time online at school is largely determined by teachers, how they spend their time online at home is more difficult to determine (Lu & Hao, 2014). While some studies have identified the integration of social media in school teaching and learning, few studies have examined what online activities students engaged when using social media at school (Rideout, Foehr, & Roberts, 2010; Roberts, Foehr, & Rideout, 2005). Given the considerable amount of time students spend online outside of school, there is a pressing need to gain a better understanding of how they use social media at home. A comparison of how teens use social media at home and at school could help educators come up with more effective ways of using social media both in and outside of school.

2.2. Factors affecting students' social media use

The second research question this study tries to answer is what factors affect Hong Kong students' use of social media when they consume, share or create content in and outside of school. Many possible factors can influence how students use social media. The existing literature has mainly focused on generic environmental factors, such as class sizes, teacher to student ratios, or educational levels of parents (e.g., Burchinal, Cyer, Clifford, & Howes, 2002; Howes, 1997). The current study, attempts to go beyond generic environmental factors to incorporate factors reflecting students' interests in different activities, their self-regulating behaviors, and the attitudes of their teachers and parents. Below we review the literature regarding the potential factors explored in this study that may influence students' use of social media in and outside of school.

2.2.1. Individual factors

Two individual factors on teenagers' social media use were included in this study: age and gender. Age has been substantially investigated as an influential factor on teenagers' social media use in the last decade. Younger 9–12 year-old students and older 15–18 year-old students tended to display different patterns of social media use. Older students were more likely to invest time on certain types of online activities, such as watching video clips or browsing news (Lenhart & Madden, 2007; OECD, 2012; Rideout et al., 2010; Roberts et al., 2005; Steeves, 2005). In particular, older students were more likely to engage in social networking activities, such as browsing information and posting contents on

social networking sites, and chatting on Instant Message; and these activities were found to increase as students grew older (Livingstone, Haddon, Görzig, & Ólafsson, 2010). Further, the types of social media students engage in also show some age discrepancies, with older 15–17 year-old teens being more active online communicators and posters than their younger 12–14 year-old counterparts (Lenhart & Madden, 2007).

Gender is the other individual factor explored in this study. Boys and girls were found to be interested in different types of online activities when using social media. Boys were found to be more avid users of video-sharing websites than girls. Lenhart and Madden, (2007) reported that boys were twice likely to watch or upload videos to video-sharing websites, such as YouTube, than girls. In contrast, girls were found to be more interested in online activities such as posting photos, writing personal blogs, or commenting on others' blogs (Lenhart & Madden, 2007). Further, girls in general were found to be more frequent social media users than boys (Lenhart & Madden, 2007; Livingstone et al., 2010).

2.2.2. Contextual factors

This study included two contextual factors on teenagers' social media use: socioeconomic status (SES) and educational levels of parents. SES might affect teenagers' social media use in multiple ways. First, SES may affect teenagers' access to technology. Although there is a growing trend among today's youth to own their own digital devices, we should not assume that every student has equal access to technology outside of school (Warschauer & Matuchniak, 2010). Second, the SES of different families also leads to different use of social media among teenagers. Lenhart and Madden (2007) reported that teens from low-SES families were more likely to write blogs, while teens from high-SES families tended to engage in multimedia-related activities, such as sharing videos, or downloading music.

Education levels of parents have been found to influence how students use social media. Broos and Roe (2006) found that mothers' education levels were significantly related to the online activity types of their adolescent daughters. Statistics show that online teens whose parents have higher levels of education are more likely to visit video-sharing websites and download podcasts. The 2013 ICILS (International Computer and Information Literacy Study) report showed that overall, the higher parents' education levels were, the better Information Literacy Skills (CITE, 2015). However, such relationship is quite weak in Hong Kong data.

2.2.3. Opinions and attitudes toward social media

How students perceive social media use and why they use it may play important roles in how they interact with social media. García-Martín and García-Sánchez (2013) suggested that students' opinions on social media use influenced their information sharing and content creation activities. Rambe (2013) in particular found that some students were reluctant to use social media for educational purposes, because they were not comfortable having teachers as online friends. In addition, students can be motivated by many factors to engage in social media, such as academic assistance, personal interest, or social need. In particular, peer influence and need for socialization with peers have been found to be important motivations in their use of social media. For example, early research indicates that adolescent Facebook use could be predicted by their need to belong and need for popularity (Baumeister & Leary, 1995; Gangadharbatla, 2008; Santor, Messervey, & Kusumakar, 2000; Utz, Tanis, & Vermeulen, 2012). In addition, Yang and Chang (2012) found that the use of blog commenting functions is positively associated with students' preference for online peer interactions and academic achievements.

2.2.4. Self-regulating behaviors

Self-regulating behaviors refer to the abilities and skills of students to set goals, monitor progress, adopt strategies, and systematically reflect on their learning results (Kitsantas & Dabbagh, 2010; Zimmerman, 2000). A substantial amount of research has identified the role of self-regulating behaviors in students' online learning. A high degree of self-regulation has been found to contribute to self-directed learning in online communication environments (Kramarski & Gutman, 2006; Vighnarajah, Wong, & Kamariah, 2009) and flexible online interaction and communication (Chen, 2009), which leads to greater achievement in their online activities. In contrast, students lacking self-regulating skills might use social media in unhealthy ways, such as dealing with boredom and loneliness, or seeking parasocial interactions (Lin, 1999). Such studies revealed that self-regulating behaviors might predict how and why students use social media, what types of social media they use and what content activities they engage in.

3. Research questions

The research questions guiding this study are as followings:

1. How do students use social media to consume, create, and share content in and outside of school?
2. Among the proposed factors, which ones most influence students' use of social media to consume, create, and share contents in and outside of school? The proposed factors include personal and contextual factors, opinions of social media, and self-regulation behaviors.

4. Methods

4.1. Participants

Two local Hong Kong schools, one public and one private, were approached to participate in this study. Comparatively, the private school had better ICT facilities to support learning and teaching, and was more progressive in integrating ICT into their curriculums. 186 students participated, 111 from the public school and 75 from the private school. The students are from secondary 2 to secondary 5, and there are 88 boys and 98 girls. Two participants were excluded from the study due to missing information.

4.2. Survey design

A survey designed by the authors was used to investigate how students used social media in and outside of school and the factors influencing their social media use. The survey covered the following dimensions: (1) how do students use social media to consume, share and create content in and outside of school, e.g., students were asked how often "I share information resources (e.g. music, video, pictures, etc.) on social media", (2) factors affecting their use of social media: (a) personal factors, gender and age (b) contextual factors, type of schools, parents' education, number of ICT devices owned, (c) students motivation for using social media, and (d) self-regulating behaviors for using social media, such as "I use social media because my friends' influence," and "I use social media because of my own personal interest,"; (e) opinions of the importance of social media functions and tools for learning, consuming, sharing and creating content. Students were asked about their perceived importance of social media activities, such as "for social communication via Facebook". Most questions in the survey used a five-point Likert Scale. For questions about social media use, response options ranged from *never use* (0) to *always use*

(4); for questions about opinions, options ranged from *strongly disagree* (1) to *strongly agree* (5), or *not important at all* (1) to *very important* (5).

4.3. Data analysis

Descriptive analysis and paired T-test were applied to examine how social media was used in and outside of school. Principal Component Analysis was used to collapse 29 items into eight proposed factors, plus grade, motivation, and gender as additional predictors. 10-fold cross validation was further used for predictor selection.

5. Results

5.1. Descriptive analysis

Table 1 gives a descriptive summary of possible factors that affecting students' use of social media. On average, the score of students' motivation for using social media and student's self-regulation in using social media is 3.64 and 3.07 respectively. Regarding students' opinions on the importance of social media in school, they valued Learning (Mean = 3.52) most, followed by Sharing (Mean = 3.32), and then Communicating (Mean = 3.18) and Consuming (Mean = 3.05); while for their opinions on the value of social media for activities outside of school, they indicated Sharing as a fairly important function of social media (M = 3.66), followed by Learning (M = 3.61), Consuming (Mean = 3.42), and Communicating (Mean = 3.25), respectively.

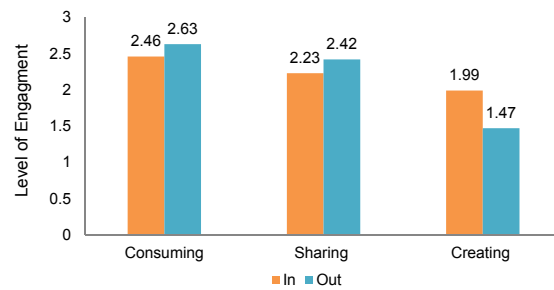
5.2. Social media usage in and outside school

The descriptive summary of how students use social media in and outside of school is presented in Fig. 1. In general, students are involved more in content consuming and sharing activities than content creating activities. Paired t-tests were run to compare the three types of social media usage in and outside of school. Significant differences were found in all types of activities. Both content consuming ($t(186) = -2.20, p < 0.05$) and content sharing ($t(186) = -2.61, p < 0.05$) activities were significantly less frequent in school than outside of school. However, content creating activities were significantly more frequent in school than outside school, (t

Table 1
Descriptive analysis of possible factors affecting social media use.

	Min	Max	Mean	SD
Background				
School	1	2	1.59	0.49
Gender	1	2	1.53	0.50
Motivation of students using social media	1	5	3.64	0.70
Self-regulation in using social media	1	5	3.07	0.75
Opinion of importance of social media for in school activities				
Consuming	1	5	3.08	0.82
Sharing	0.6	5	3.31	0.82
Communicating	1	5	3.20	0.78
Learning	1	5	3.53	0.80
Opinion of social media for outside school activities				
Consuming	1.33	5	3.45	0.62
Sharing	1.2	5	3.62	0.78
Learning	1	5	3.62	0.62
Communicating	1	5	3.26	0.79

Notes: School: 1 refers to private school, and 2 refers to public school; Gender: 1 refers to boys, and 2 refers to girls; Self-regulation in using social media: 1 means "never" and 5 means "always"; Factors motivating students using social media: 1 means strongly disagree and 5 means strongly agree; Opinion of social media for inside/outside school activities: 1 means strongly disagree and 5 means strongly agree.



Note: Creating: content creating; Consuming: content consuming; Sharing: content sharing; In: social media use inside school; Out: social media use outside school.

Fig. 1. Means for the content consuming, sharing and creating produced by the sample (N = 168).

(186) = 6.71, $p < 0.001$).

5.3. Most important predictors of social media usage in and outside school

5.3.1. Principal Component Analysis

Principal component analysis (PCA) was conducted on the items measuring proposed predictors that cannot be directly observed. There were seven predictors that cannot be directly observed, including students' opinions on learning, communicating, consuming, and sharing contents, students' motivation for social media usage, students' online self-regulatory behaviors, and their family educational levels for both in and outside of school. The first principal component of each PCA analysis was used to represent the factor those questions intended to measure. The variance proportion of each predictor explained by the first principal component is presented in Table 2.

The Kaiser-Meyer-Olkin (KMO) measure and Bartlett's test of sphericity were applied to verify the validity of PCA. The sampling adequacy was verified for the all factors, with all KMO values bigger than 0.5. The results of Bartlett's test of sphericity were all significant, indicated that correlations between items were sufficiently large for each factor.

5.3.2. Most important predictors of social media usage inside and outside school

Ten-fold cross-validation was used to determine the number of most important predictors of three types of social media usage inside and outside school respectively by comparing the test errors of models with different combination of predictors. For both in and outside of school activities, ten-fold cross-validation was applied 1000 times to stabilize the randomness of the results (see Fig. 2). As for in school models, 7, 4 and 8 predictors were selected separately for content consuming, sharing and creating by majority votes. As for outside of school models, two predictors were selected each for content consuming, sharing and creating by majority votes. The

Table 2
The variance proportion of each predictor explained by the first principal component.

	Inside school	Outside school
Opinions on learning	0.80	0.64
Opinion on communicating	0.64	0.68
Opinions on consuming contents	0.63	0.47
Opinions on sharing contents	0.70	0.64
Motivation for social media usage	0.78	0.78
Online self-regulatory behaviors	0.67	0.67
Family Educational level	0.79	0.79

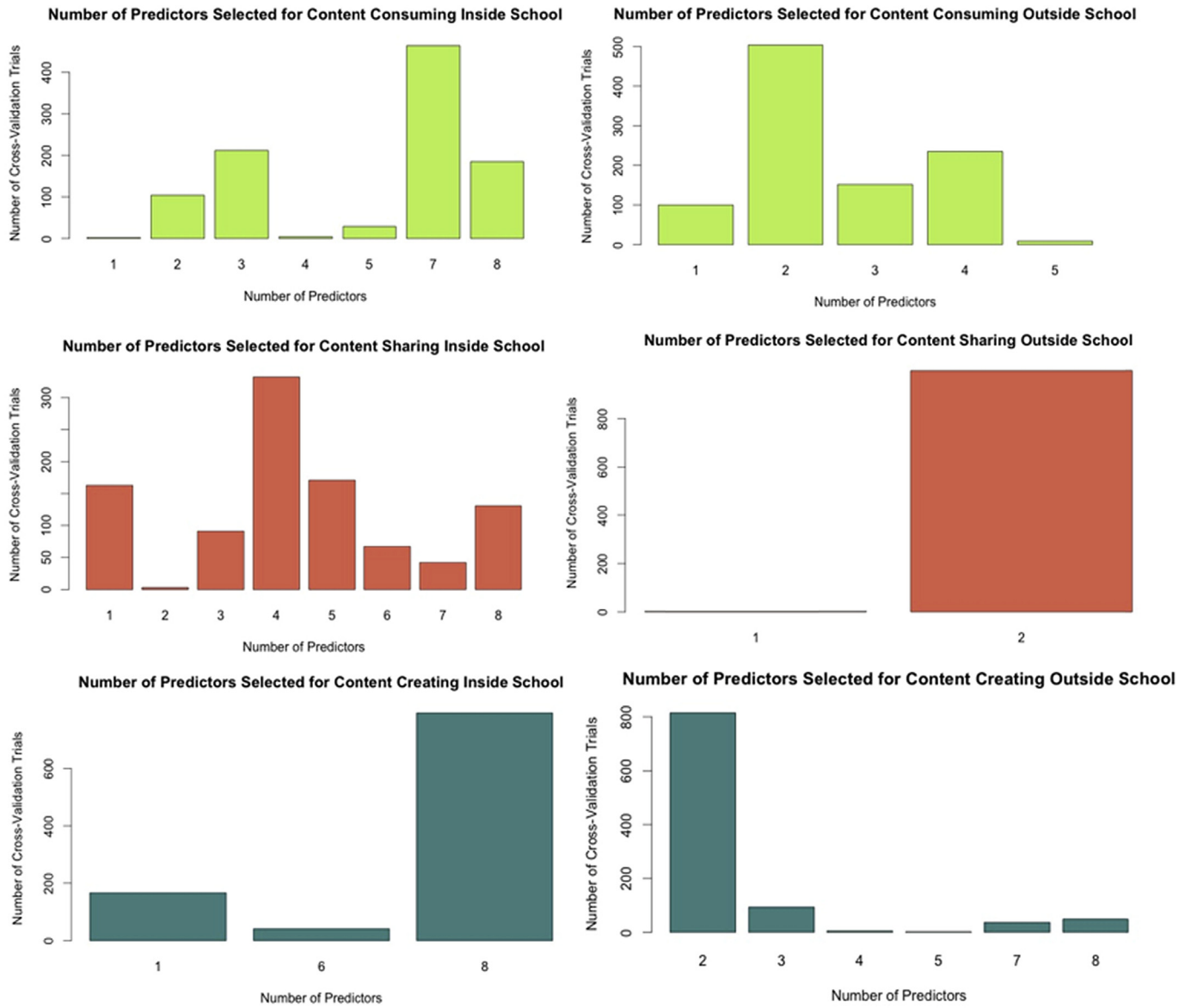


Fig. 2. Numbers of predictor selected for social media usage outside school by cross validation.

selection of the specific predictors was performed on the full data set to ensure the accuracy of predictor coefficient estimates.

5.3.3. Regression model construction of inside school social media activities

A series of multiple regression analysis were run to examine the contribution of each selected factor to the social media usage. The selected predictors for each type of social media usage in and outside of school are presented in Table 3 and Table 4, respectively.

As for the analysis of social media use in school, the change in R^2 indicated that: (1) the students' school, gender, opinions on four types of social media activities, and their self-regulatory behaviors jointly explained 32% of the variance in their content consuming. In addition, students' opinion on consuming content, learning, and communicating turned to be the most significant predictors of their content consuming on social media; (2) students' opinions of consuming, sharing and communicating with social media, and their online self-regulatory behaviors jointly accounted for 26% of the variance in content sharing activities. In particular, opinions on

sharing content and self-regulation behaviors variables made significant contributions; and (3) the students' school, gender, opinions on four types of social media activities, their motivation for social media use, and their self-regulatory behaviors jointly explained 35% of the variance in content creating activities. Among the variables, gender, opinions on sharing content, learning, and communicating in social media are significant predictors.

Regarding the model of social media engagement outside school, the change in R^2 indicated that: (1) the students' opinions on sharing content and learning on social media jointly explained 24% of the variation in their content consuming activities. And both of them were significant predictors of the student's content consuming activities; (2) the students' opinions sharing content and online self-regulation behaviors jointly explained 20% of the differences in their content sharing activities on social media. In particular, either of the two variables made significant contributions; and (3) the students' opinions on sharing content and their self-regulatory behaviors jointly account for 12% of the variation in their content creating outside school. In addition, these two factors

Table 3
Multiple regression analysis on selected predictors of three types of social media usage inside school.

	R^2	R^2_{adj}	ΔF	β	t
Content consuming	0.32***	0.29	11.97		
School				-0.06	-0.90
Gender				-0.02	-0.30
Opinion on consuming content				-0.15	-1.61
Opinion on sharing content				0.29**	2.80
Opinion on learning				0.17*	2.18
Opinion on communicating				0.27**	2.83
Self-regulatory behaviors				-0.09	-1.35
Content sharing	0.26***	0.24	15.59		
Opinion on consuming content				0.13	1.44
Opinion on sharing content				0.21*	1.99
Opinion on communicating				0.18	1.89
Self-regulatory behaviors				-0.15*	-2.33
Content creating	0.35***	0.32	11.74		
School				-0.09	1.34
Gender				-0.14*	2.02
Opinion on consuming content				0.14	1.54
Opinion on sharing content				0.34**	3.38
Opinion on learning				-0.16*	2.17
Opinion on communicating				0.20*	2.15
Self-regulatory behaviors				-0.12	1.86
Motivation for social media usage				-0.08	1.13

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Table 4
Multiple regression analysis on selected predictors of three types of social media usage outside school.

	R^2	R^2_{adj}	ΔF	β	t
Content consuming	0.24***	0.23	28.14		
Opinion on sharing content				0.35***	4.92
Opinion on learning				0.22**	3.02
Content sharing	0.20***	0.19	22.46		
Opinion on sharing content				0.37***	5.59
Online self-regulatory behaviors				-0.22**	-3.34
Content Creating	0.12***	0.12	13.06		
Opinion on sharing content				0.25***	3.66
Online self-regulatory behaviors				-0.23**	-3.33

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

turned to be the most significant predictors of their content creating on social media.

6. Discussion

The research presented in this paper compared the use of social media in and outside of school among secondary students in Hong Kong by examining their content consuming, sharing and creating activities with social media. As a whole, although their in-school and outside-of-school patterns of social media use are similar there are significant differences for each type of content activity. Perceived importance of sharing is the most significant factor for all social media activities both in and outside of school. Self-regulation ability is the second significant factor negatively impacting some social media activities. In the section below we discuss the differences between in-school and outside-of-school activities and possible reasons for these differences.

6.1. Social media use in and outside school

Social media activities demonstrate similar patterns in and outside of school. In both environments, students engaged in content consuming the most and content creating the least. Our findings suggest that while consuming content like reading online

material and watching videos were major social media activities, creating content and disseminating materials were minor social media activities. Available research is limited to how adolescences and young adults use social media (Pempek, Yermolayeva, & Calvert, 2009), however, our conclusion is empirically supported by the findings of Suzuki and Calzo's (2004) study of bulletin boards use by teens, and by Pempek et al. (2009) study of young adults' Facebook use. It was found that visitors to bulletin boards spent considerable time "lurking", or reading the posts of others without posting any reply, and that Facebook users spent more time observing content than actually writing content. Furthermore, it is also reported in a recent census about social media use by teens in the U.S. that 39% of their time on any given day spent using digital devices is devoted to passive consumption, of which 25% is interactive consumption, 26% is communication, and merely 3% is creating content. Evidence of the dominance of information-consuming activities was also detected in another Hong Kong indicating that ICT use in Hong Kong schools was limited to information searching (Law, Chow, & Yuen, 2005). A recent international investigation also confirmed this finding (CITE, 2015) indicating that online students mainly search for and consume information. Hong Kong students are not exceptional.

However, there are significant differences between students' social media use in and outside of school for each type of content activity. Students used social media to consume and share more content outside of school than in school. This pattern has also been identified in the literature on Web 2.0 technologies (Clark, Logan, Luckin, Mee, & Oliver, 2009). Clark et al.'s study investigated what 11 to 16 year-old students did on with Web 2.0 sites, including MSN, Facebook, MySpace, YouTube etc. They found the in-school Web 2.0 use was much lower than out-of-school use. There are two likely explanations for this discrepancy. First, students and teachers perceive social media as a tool mainly for social, leisure and entertainment purposes (Boyd, 2007; Buckingham, 2007; Clark et al., 2009) and not as a tool for formal and learning-orientated practices (Clark et al., 2009). The second explanation might be associated with Internet use in the two settings. It has been widely reported that, due to the limited access to the Internet in school, and the nature of course design, dramatically less students engage in Internet and ICT activities in school than outside of school (Hakkarainen et al., 2000; Mumtaz, 2001; Nachmias, Mioduser, & Shemla, 2001, 2000; Papastergiou & Solomonidou, 2005). Even though social media activities and ICT activities differ in many ways, it is also subject to Internet access. Our finding thus confirms the dissonance around students' in- and out-of-school Internet and ICT experiences in social media use.

However, the present study found an exception to using social media for content creation. Interestingly, contrary to the other two types of social media activity, content creating was engaged in significantly more in school than outside of school. This inconsistency might be explained by the distinct nature of different content activity on social media. Using social media to produce, create and disseminate material requires more intellectual effort and serious engagement than consuming and sharing content does. Given that students have easier Internet access outside of school than in school, they are more likely to consume and share information to relax and entertain themselves, whereas they are more likely to use social media to create content in school because teachers both require and scaffold their efforts to do so. A wealth of research has demonstrated the value of school guidance in fostering students' sophisticated use of technologies and social networking tools, including inspiring students' innovation and creativity (Discipio, 2008; Kear, 2011; Mak & Coniam, 2008). The Hong Kong Government has invested considerable efforts in promoting ICT use in learning and teaching. Since the 1998/99 school year, Hong Kong

schools have gone through four stages of ICT integration in education that are marked by four strategy documents/policies respectively, reflecting a commitment to facilitating students' use of technology in schools. The current study adds to the literature that Hong Kong secondary students engage in more content creating activity with social media in school environments, though it is still dramatically less when comparing to other two types of activities. Further studies are needed to investigate the quality of the content created and the relationship between this greater engagement in content creation and pedagogical design.

6.2. Predictors of social media engagement

The present study examined personal, contextual factors, social media opinions and self-regulation behaviors that might influence the social media use of secondary school students. Statistically significant effects of students' self-regulation behaviors and their opinions about the content activities were found in the use of social media for consuming, sharing and creating content. Likely reasons for these effects are discussed below. In general, different pattern of predictions were found in and outside of school. The in school models involve more predictors which implies that students' social media activity are related to more factors, while the outside of school social media model is relatively simple and mainly predicted by opinions on sharing content.

6.2.1. Personal factors

The present study detected no major gender effect for social media use in either context except a weak effect on content creating in school. Boys tended to create more than girls in terms of school content creation activities. It appears to be inconsistent with previous research as gender differences in teen's activity on social media are widely reported in western countries. For example, teen girls engaged in more communication activities than teen boys, and created or worked more on their own homepages and posted more photos online (Lenhart & Madden, 2007); and women are more drawn to social networking sites (Correa, Hinsley & De Zuniga, 2010). ICILS 2013 Hong Kong report also showed that girls demonstrated more advanced IL skills than boys. However, these social media studies focused on the type of media activities. The current research employed a typology that categorizes social media engagement from the dimension of the nature of online activity, including content consuming, content sharing and content creating. In this case, it could be that gender differences exist in students' engagement in social media activities of different media types; whereas, they do not exist in student's engagement in activities of a different nature, as males and females could display opposite patterns of engagement in different types of social media activities of the same nature. For example, with respect to content creating activities, teen girls were found to produce more blogs than their male counterparts (Lenhart et al., 2015), while online, boys did more webpage creation (Papastergiou & Solomonidou, 2005); as for content sharing activities, teenage girls share more on social media sites and platforms, particularly visually-orientated ones, than boys, who were found to be more avid users of video-sharing websites (Lenhart et al., 2015). Therefore, under the typology for social media engagement adopted in current research – content consuming, content sharing and content creating, girls and boys differ slightly in their general use of social media.

6.2.2. Contextual factors

Parents' education had no impact on any kinds of social media use. This finding is inconsistent with the literature which showed positive correlations between parents' education level and students' information literacy. However, it consistent with the findings

from Hong Kong case indicating that SES, including parents education has no impact on students computer and literacy skills (CITE, 2015). The possible explanation could be that ICT immersion in schools and families is substantially sponsored by the government so the digital divide is not an issue in Hong Kong.

No significant effect for the number of IT appliances that the students owned was found in their social media engagement either in or outside of school. The possible explanation is that social media engagement regardless of the content type puts little demand on technology appliances, including the amount and function of devices. This characteristic of social media could be traced to its nature. The strong compatibility of social media applications and software with technology devices significantly increases the accessibility and affordability of social media. Any digital equipment, mobile telephony, digital television or tablets, enables people to engage in social media. As such, the present study demonstrates that the number of IT tools owned by students is not a determining factor in the degree of social media engagement and type of content activity of students. On the other hand, mobile phones could be the most important tool for social media, given the new concept of Mobile Social Media (Kaplan & Haenlein, 2010), that has emerged in recent years. The situation could be particularly apparent in Hong Kong, because the rate of ownership and use of smart phones is very high among Hong Kong students. A survey conducted in 2012 reported that 97% of participating high school students had their own mobile phones, over 70% of them invested at least 1 h in using them per day, and most of the time was spent on social media apps, such as WhatsApp, Wechat and LINE (The Hong Kong Computer Society, 2012). From this sense, the present study provides empirical evidence for the prediction that social media, particularly Mobile Social Media, contributes to Internet democratization and to closing the digital divide with respect to content engagement with social networking (Kaplan & Haenlein, 2010). Our finding substantiates the recent focus of attention on digital divide that has shifted from the physical access to network connections and technology appliances to people's capabilities and skills in using and applying them (van Dijk, 2006).

6.2.3. Perceived importance and self-regulation of using social media

Students' opinions on the importance of social media usage and self-regulation on using social media are the major factors in the regression models predicting social media use in and outside of school environments. Interestingly, there are some indirect relationships between perceived importance of social media use and the actual use of them. For instance, the more students perceived the importance of sharing and communicating, the more they consumed in school. In particular, the perceived value of social media in sharing interest with others has a significant overall effect in students' different content activities both in and outside of school. This is confirmed by earlier research on students' social media use in higher education. For example, in Jones, Blackey, Fitzgibbon, and Chew (2010) examining university students' reasons or motivation for using of social software, 96% of the respondents reported the need for more communication with peers and 93.34% indicated peer sharing and encouraging. Our finding highlights the social role of social media in Hong Kong secondary school students' media consumption. There is a mutual and reciprocal interplay between their social media activities and social connectivity with peers. This implication corroborates with Arnett's perspective that social media has gradually been becoming a new source of socialization in adolescents (Arnett, 1995).

With respect to content creating, the effect of students' opinions on social media's value display different patterns in and outside of school. In outside of school contexts, the more importantly the

students perceived social media in sharing interests and information with friends, the more frequently the students engaged in content creating activities. However, in school contexts, students' opinions of social media's value in promoting learning and communicating were also found to be important predictors of their engagement in content creating. It is possible that, in school social media's usage, creating content in the present study, is more related to school work and study tasks; whereas, in home environments, students prefer to use it primarily for personal interest, entertainment and social networking with friends, which is in line with findings in the literature (Buckingham, 2007; Lee, Cheung, & Chen, 2005; Papastergiou & Solomonidou, 2005). This inference supplements the conclusion of earlier research that university students tend to separate their social life from their learning and they use social media primarily for entertainment purposes instead of education purposes (Jones et al., 2010) by indicating that secondary students' opinions of social media's role might be altered in school settings. Another possible explanation for the inconsistency in content creation between scholastic and extra-scholastic environment lies in the nature and characteristics of content creating activity. Compared with content consuming and sharing, content creating is a more sophisticated activity and requires higher levels of intellectual effort. According to our findings, in school context, students' content creating behavior is stimulated by their awareness of social media's importance in academics learning and communicating with classmates or teachers, which could be due to the curriculum or designed in class activities. Therefore, it could be inferred that schools scaffold students' creating activity with social media. Again, the explicit role of school guidance in facilitating social media's use in learning deserves further investigation.

Self-regulation of using social media was found to negatively affect social media activities in both contexts. It is significant to predict sharing and creating content outside of school and only significant to sharing in school. The better they feel they can regulate their social media use, they less they engaged in social media activities. This impact is more obvious on outside school media use. Social media use at school is directed and regulated by teachers based on teaching plans or curriculum guidance, whereas little restriction could be imposed on students' social media usage outside school. As such, at home environment where a large degree of freedom and autonomy is given, whether the students are self-regulated enough to control their online behavior and engage in certain types of social media activity becomes crucial. Therefore, students' self-regulation behaviors, such as their abilities to regulate their social media usage and planning or time-management strategies, play an important role in their social media engagement outside school.

The students who perceive themselves as more capable in self-regulation engage less frequently in content sharing and creating activities. It has been widely reported that considerable time of social media visitors has been spent in social media activities, such as passively browsing on social networking sites, observing what other are doing and lurking while consuming content (Pempke et al., 2009; Suzuki & Calzo, 2004). Such addictive activities can be characterized as lacking in self-regulation. In contrast, it is likely that the more self-regulated visitors who are capable of making and following plans concerning their social media engagement would have more deliberative or goal-directed activities, including more intellectual and sophisticated activities of content creation. However, in our study, it seems that students who are capable of regulating their social media use are very conscientious with respect to spending time on social media, including creating content, which might require serious efforts and lots of time. Numerous studies have identified social media's role in supporting students' self-regulation learning and skills (Kitsantas & Dabbagh,

2011; Kitsantas & Dabbagh, 2010; Schmidt, 2007; Turker & Zingel, 2008), but little is known about whether students' self-regulation competence, in turn, affects their social media activities. Our finding sheds light on the potential relationship between self-regulation and content creating on social media. However, more studies are needed to explore the dynamic and underlying mechanism of this relationship.

7. Conclusions and limitations

New social media, does not only serve for social and entertainment, but also starts to play major roles in learning, no matter formal or informal, in or outside school. This study attempts to characterize levels of social media activities, and compare such activities between in and outside of school contexts to understand their relationships.

The findings of this study can inform the efforts of teachers to support the social media activities, especially content creating activities of their students. However, preparing students to use social media properly and effectively so as to foster learning remains a challenge to teachers. It is suggested that structured learning environments should promote the constructive and creative use of social media for learning while aimless online activities such as consuming irrelevant content, and networking with friends should be discouraged according to the increasing report on the impact of social media use in the classroom (Carter et al., 2016). In addition, our finding that outside of school students engage in significantly less creating but more consuming and sharing activity than in school suggests that the family has an important role in guiding how students use social media. Since family is identified as a primary context of social media use, how to scaffold, at home environment, adolescents' sophisticated media engagement with high level of intellectual effort is a significant and promising issue for digital families.

The findings of this study also showed the pattern of students' social media activities and the factors influencing them. However, given it's the scale, we did not investigate such important psychological factors, as sociability, self-esteem, executive control, and social-emotions. Further, self-report surveys have limitations in understanding the quality of students' actual social media behavior. In the future qualitative case studies and/or using online tracking systems for observing students' social media activities may provide more fine-grained evidence. With its relatively small sample size generalizing the results of this study to larger populations is challenging. Future studies should use larger sample sizes and more systematic sampling techniques, such as stratified sampling.

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