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Effects of social media usage and social media multitasking on the academic performance of university students

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A B S T R A C T

In today's society, social media have become an almost indispensable part of daily life, particularly among university students, who are generally heavy social media users. Social media multitasking has also been increasingly prevalent. Little, however, is known about how social media usage and social media multitasking influence the academic performance of university students. This study examined whether and how these two behaviors predict academic performance among university students. From a sample of 348 undergraduate students at a comprehensive university in Hong Kong, this study found that using social media for academic purposes was not a significant predictor of academic performance as measured by cumulative grade point average, whereas using social media for nonacademic purposes (video gaming in particular) and social media multitasking significantly negatively predicted academic performance.

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1. Introduction

Social media have penetrated the lives of many young adults. The social media usage of American adults aged 18–29 years soared from 12% in 2005 to 90% in 2015 (Pew Research Center, 2015). In education, social media can be used to share information with students, collect information when overseas or while conducting research, share personal academic interests with other people, engage students and understand what they think about during instruction, form student study groups, and enhance e-textbook functions by connecting students with social tools for collaborative purposes (O'Brien, 2012). Social media also develop students' capacity to create and arouse their interests in academic subjects (Lau, Lui, & Chu, 2016), and students more easily communicate with working professionals through social media. Cox and McLeod (2014) found that social media foster communication among teachers, students, parents, and community members, and help create online professional learning communities.

In university, students and faculty members have increasingly adopted various social media tools such as Facebook and Twitter to promote teaching and learning both inside and outside the classroom. Empirical studies have shown the following educational benefits associated with the use of social media technologies: (a) enhanced communication between students and instructors, (b) increased opportunities for networking or collaborations among students, (c) rapid sharing of resources, (d) access to course materials by students after class, (e) provision of an alternative platform to the official learning management systems, and (f) exposure of students to technologies and skills that may improve their employment success (Legaree, 2015).

Because students are likely to use more than one medium simultaneously, the potential influence of media multitasking behavior has been under scrutiny for years. Regarding cognition, media multitasking was found to be negatively related to cognitive control ability in adolescents (Ophir, Nass, & Wagner, 2009). Thus, it is believed to be predictive of poor academic performance. Today, a majority of social media tools support the integration of multimedia elements, and this functionality makes media multitasking much easier than was previously possible. Researchers and educators alike are interested in the effects of social media on student academic performance, and numerous empirical studies have explored whether such effects are positive, neutral, or negative (Cheston, Flickinger, & Chisolm., 2013; Glogocheski, 2015). Little, however, is known about how social media usage and social media multitasking (SMM) influence the academic performance of university students. Accordingly, this study examined whether and how these two behaviors predict academic performance among university students.

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2. Social media usage and media multitasking

Social media come in a variety of forms including social networking sites, microblogs, blogs, chat platforms, open source mapping, and photo and video sharing (Gastelum & Whattam, 2013). In general, social media can be defined as "applications, services, and systems that allow users to create, remix, and share content." (Junco, 2014, p. 6). Social media usage refers to "the multiplicity of activities individuals may participate in online" (Smith & Gallicano, 2015, p. 83). This description focuses on numerous online activities that people can engage in with social media and is primarily related to the purposes of using social media.

Multitasking is typically understood as the engagement in more than one task within a given period of time. Multitasking may take three forms: dual-tasking, rapid attention switching, and continuous partial attention (Wood & Zivcakova, 2015). Dual-tasking refers to the situation in which individuals complete two tasks simultaneously, rapid attention switching refers to a change of focus between tasks, and continuous partial attention entails partial attention to more than one task continuously. Media multitasking involves simultaneous participation in activities, at least one of which must be media related. Media multitasking may occur between different devices or on a single device (Kononova & Chiang, 2015).

Regardless of the forms that multitasking behavior may take, studies have suggested that SMM is prevalent, particularly among youth. Voorveld and van der Goot (2013) showed that people in younger age groups (13—16, 17—19, and 20—24 years) spent more time on media multitasking relative to the total media time compared with their counterparts in older age groups (25—29, 30—39, 40—49, and 50—65 years). For the age groups 13—16 and 17—19 years, social media with music or websites was the second most common media multitasking combination. Voorveld, Segijn, Ketelaar, and Smit (2014) found that in Germany, the United States, the United Kingdom, the Netherlands, France, and Spain, the three most common media multitasking combinations were the concurrent use of social media and new media such as e-mail and mobile phones, the concurrent use of TV and new media, and the concurrent use of the Internet and new media. Age also significantly predicted multitasking with new media, meaning that younger people are more likely to multitask with new media.

3. Social media usage and academic performance

Regarding the purposes of using social media, Oye, Adam, and Nor Zairah (2012) indicated that academic performance was adversely affected when social networking sites were used to fulfill social and nonacademic needs only. Ravizza, Hambrick, and Fenn (2014) reported that nonacademic Internet use, including social media, among university students was negatively associated with classroom performance as shown in three examinations during the semester and cumulative final examinations. However, some evidence suggests benefits of social media use in learning. For instance, the use of Twitter for academic and cocurricular discussions was found to have a positive effect on grades for college students (Junco, Heiberger, & Loken, 2011). Students who used Twitter showed higher levels of engagement and obtained a higher semester grade point average (GPA) than students who did not. The positive effect could be explained by the extended engagement between students and faculty via Twitter beyond traditional classroom activities. GreGory, GreGory, and Eddy (2014) demonstrated that the adoption of Facebook as an instructional network—in that case, the creation of a Facebook group specifically for discussing mathematical course content outside of class—could significantly increase undergraduate student engagement, satisfaction, and performance in a calculus course. Therefore, the following hypotheses were proposed:

H1. *Students who use social media more for nonacademic purposes perform less favorably academically.*

H2. *Students who use social media more for academic purposes perform more favorably academically.*

4. Media multitasking and academic performance

Studies examining the influence of media multitasking on academic performance have reported that media multitasking has a negative effect on three aspects of academic performance, namely, academic outcomes, study related behaviors and attitudes, and perceived academic learning (van der Schuur, Baumgartner, Sumter, & Valkenburg, 2015). The time displacement hypothesis and the limited information processing capacity hypothesis are frequently used to explain why media use during academic work adversely affects academic performance. The time displacement hypothesis posits that because of the appealing nature of most media today, students are likely to devote far more time to any media than to academic activities. Some may even skip class and choose to use media instead. Media tend to distract student attention from their studies and subsequently decrease their performance and efficiency (Walsh, Fielder, Carey, & Carey, 2013).

The limited information processing capacity hypothesis proposes that as multiple tasks are performed simultaneously, a cognitive bottleneck develops because of the limits of cognitive capabilities, and this results in an appreciable disruption in the decision-making process. Multitasking performance in multimedia learning environments can often be explained using cognitive load theory or the cognitive theory of multimedia learning. Cognitive load theory focuses on the role of working memory in the learning process (Sweller, 1988). The theory is premised on the following concepts: (a) working memory is limited in capacity, (b) long-term memory has essentially unlimited capacity, (c) the learning process requires working memory to be actively involved in the processing and comprehension of the instructional materials to encode information into long-term memory, and (d) learning is ineffective if working memory is overloaded. Cognitive load refers to the total amount of mental effort demanded on working memory at any particular instance, and the number of elements requiring attention constitutes the major factor influencing cognitive load. There are three types of cognitive load: intrinsic, extraneous, and germane. Intrinsic cognitive load is induced by the inherent complexity and difficulty of the materials being learned. Extraneous cognitive load is caused by the manner in which the instructional materials are designed and presented. Germane cognitive load is created by effortful learning devoted to the processing, construction, and automation of schemas. The theory predicts an increase in intrinsic or extraneous load that impedes learning when students multitask. For example, when students are engaged in off-task activities using technology, an additional load is imposed on the learning task that must be completed.

The cognitive theory of multimedia learning is based on three research-based principles in cognitive science: that learners (a) have two separate channels for handling verbal and pictorial information, (b) can process only a limited number of elements in each channel at a time, and (c) must select, organize, and integrate appropriate information from the instructional materials with existing knowledge into long-term memory for meaningful learning to occur (Mayer, 2010). In other words, learners must pay attention to relevant words and pictures for further processing,