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Social media use and college students' academic performance: Student engagement as a mediator

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We investigated the relationships between students' social media use, engagement, and academic performance, proposing that student engagement would mediate the social media use–academic performance relationship. Using survey data from 307 Chinese college students, we found that student engagement played a mediating role in the link between social media use and academic performance. In addition, the results show that the direct effect of social media use by college students on their academic performance was nonsignificant. Our results contribute to knowledge of the relationships between social media use, student engagement, and academic performance in a Chinese higher educational context. They also provide educators with meaningful implications for improving students' academic performance. Future directions for research are discussed.

Keywords
social media use;
academic learning;
academic performance;
student engagement;
Chinese college students;
social networking

In recent years social media have provided users with new opportunities for communication and collaboration to foster a student-centered learning environment (Makkonen et al., 2014). This has resulted in improved student academic performance (Bayliss & Warden, 2011). Indeed, educators are using social media as a teaching tool to modernize teaching (Simplicio, 2015). However, previous researchers have reported inconsistent findings on social media use and its influence on student academic performance in higher education (Junco, 2012; Lambić, 2016; Nwazor & Godwin-Maduike, 2015), about which there is still considerable academic debate. For example, Lambić (2016) found that Facebook use among students in the Faculty of Education in Sombor (Serbia) was related to their improvement in academic performance. Lambić proposed that as social media use facilitates communication among students and teachers, this was beneficial for academic information gathering, resulting in a good academic performance. Conversely, Junco (2012) investigated the relationship between multiple measures of frequency of Facebook use and academic performance in a sample of 1,839 U.S. college students, and found that time spent on Facebook was significantly and negatively related to overall college grade point average. In addition, in a study conducted in Nigeria, Oguguo et al. (2020) found that the frequency of accounting student participants' social media use had no effect on their mean academic achievement. Nwazor and Godwin-Maduike (2015) found in their survey of Nigerian business education students that 73% indicated that Facebook use negatively affected their academic performance and 27% indicated it had a positive effect.

China has the largest number of Internet-using citizens worldwide. As of June 2020, there are 940 million Internet-using citizens in China, with an Internet penetration rate of 67%, of which students at 23.7% constitute the largest group of these netizens (China Internet Network Information Center, 2020). With technology advancement, a variety of social media, such as QQ, WeChat, WeBlog, and online forums, are

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available for Chinese college students to share information and supplement their lecture-based learning. However, there is growing concern about how social media use affects their academic performance. Further, Ko et al. (2016) suggested that learning outcomes rely on the degree of students' engagement. In this study we focused on students' social media use in the context of learning, and in their engagement in the study program.

Literature Review and Hypothesis Development

In higher education, social media can be an effective tool for learning activities involving communication, for example, communication for sharing, discussion for learning, and content generating (Rahman et al., 2020). Researchers have found that social media use for learning activities is positively related to academic performance of students (Al-Rahmi et al., 2015; Lambić, 2016). Social media provide college students with an opportunity for online interaction with course peers (Selwyn, 2009), and peer interaction via social media can significantly enhance college students' academic performance (Al-Dheleai & Tasir, 2017). In addition, social media offer high student–teacher interaction: Students use social media to communicate with teachers about learning materials, assignments, and other course-related matters (VanDoorn & Eklund, 2013). Lambić (2016) found that the frequency of use of social media as a learning aid was positively related to college students' academic performance. Social media are thus an innovative and effective tool to motivate and involve students in the learning process, which enhances their learning experience in higher education (Oktavia et al., 2016). Therefore, we proposed the following hypothesis:
Hypothesis 1: Social media use will be positively related to college students' academic performance.

Rutherford (2010) defined *student engagement* as "both the time and energy students invest in educationally purposeful activities" (p. 704). Ahn (2011) proposed that social networking sites provide an additional link to student learning through academic engagement. As social media are an information and communication technology-based tool (Jena, 2015), they can be used to facilitate student engagement. Dragseth (2020) proposed that social media tools like Facebook and Twitter can be used in undergraduate and graduate education to increase student engagement. College students frequently use information technology for collaborative learning and student–faculty interaction in academic life, which facilitates their engagement (Laird & Kuh, 2005). Hu and Kuh (2001) examined the importance of campus wiredness on college students' learning outcomes. They found that students on the most wired campuses, compared with those on less wired campuses, were more active in learning activities and had more frequent contact with faculty. Thus, they suggested that information technology can be used to enhance student engagement. Therefore, we proposed the following hypothesis:
Hypothesis 2: Social media use will be positively related to student engagement.

It is widely accepted in the organizational behavior literature that individual engagement facilitates individual performance (Gruman & Saks, 2011). In the higher education context, student engagement is a potential predictor of academic outcome (Fursman, 2012), and academic researchers have found a positive relationship between student engagement and academic performance. For example, Vîrgă et al. (2020) conducted a survey with 420 college students in India and Romania to explore a student engagement–academic performance link. Their results show that an increase in student engagement predicted improvement in academic performance. Therefore, we proposed the following hypothesis:
Hypothesis 3: Student engagement will be positively related to academic performance.

Social media open the door for the development of high-quality peer relationships. Previous researchers have found positive links between high-quality student interpersonal relationships, academic engagement, and academic performance achievement (Martin & Dowson, 2009), and Junco et al. (2011) found that enhanced engagement via social media empowered students, which translates into achievement. Therefore, we proposed the following hypothesis:
Hypothesis 4: Student engagement will mediate the relationship between social media use and academic performance.

Method

Participants and Procedure

We employed an online survey (www.wjx.cn) to collect data from students at a Chinese public university in Guangzhou. The 400 college students who took part completed the survey via email or via social media sites, and we received 307 valid surveys (response rate = 76.75%). Written informed consent was obtained from all participants, who were informed of the purpose of the survey and assured that their participation would remain anonymous. This study was approved by the Ethics Committee of Guangdong University of Technology.

Of the 307 participants, 169 were men (55.05%) and 138 were women (44.95%), and their ages ranged from 18 to 23 years (M = 21.04, SD = 1.78). The participants' majors were marketing (28.34%), human resource management (11.69%), accounting (32.25%), tourism (8.50%), and finance (19.22%). In addition, every participant had more than 5 years' experience with social media use.

Measures

Two bilingual academics translated the English scales into Chinese using the standard back-translation procedure. Two education professors checked the equivalence of meaning and adapted the scales for the Chinese cultural context. All items were rated on a 5-point Likert scale (1 = *strongly disagree*, 5 = *strongly agree*).

Social Media Use

Social media use was measured with three items from Sun's (2020) scale, which was adapted from Cao et al. (2016): "I often use social media for the purpose of studying," "I use social media to maintain and strengthen communication with schoolmates and teachers when I am studying," and "I use social media to obtain study-related information and knowledge."

Student Engagement

Student engagement was measured with the University Student Engagement Inventory (Maroco et al., 2016), which consists of three subscales, each comprising five items: behavioral engagement, emotional engagement, and cognitive engagement. Sample items are, respectively, "I usually participate actively in group assignments," "I am interested in the school work," and "I talk to people outside the school on matters that I learned in class."

Academic Performance

Academic performance was measured with three items from Al-Rahmi et al. (2015). The items are "The use of social media allows me to better understand the concepts in my subject area," "The use of social media leads to a better learning experience," and "The use of social media has improved my comprehension of the concepts studied."

Results

Reliability

Cronbach's alpha for the study variables are shown in Table 1. The three factors had acceptable values (> .70), showing good reliability and internal consistency of each scale.

Table 1. *Descriptive Statistics, Correlations, and Reliabilities for Study Variables*

	α	*M*	*SD*	1	2	3
1. Social media use	.88	3.73	0.62	—		
2. Student engagement	.85	3.36	0.78	.33**	—	
3. Academic performance	.87	3.54	0.61	.40**	.42**	—

Note. $N = 307$.
** $p < .01$.

Common Method Variance Test

We conducted a confirmatory factor analysis to test whether the hypothesized model captured distinct constructs. The results show that the three-factor model (social media use, student engagement, and academic performance) had a reasonably good fit to the data, root mean square error of approximation (RMSEA) = .06, comparative fit index (CFI) = .98, Tucker–Lewis index (TLI) = .98, and that the fit was better than that of the single-factor model, RMSEA = .21, CFI = .62, TLI = .60. As these results indicate acceptable levels of discriminant validity, common method variance was not a serious concern.

Hypothesis Testing

We tested Hypotheses 1 to 4 using structural equation modeling (SEM) with Amos 22.0. As shown in Figure 1, there was a positive relationship between social media use and student engagement, and between student engagement and academic performance. Thus, Hypotheses 2 and 3 were supported. However, social media use was not significantly related to academic performance. Thus, Hypothesis 1 was not supported. We also applied a bootstrapping analysis with 2,000 resamples to test the mediating effect. Results show that the indirect relationship between social media use and academic performance through student engagement was significantly positive. Thus, Hypothesis 4 was supported.

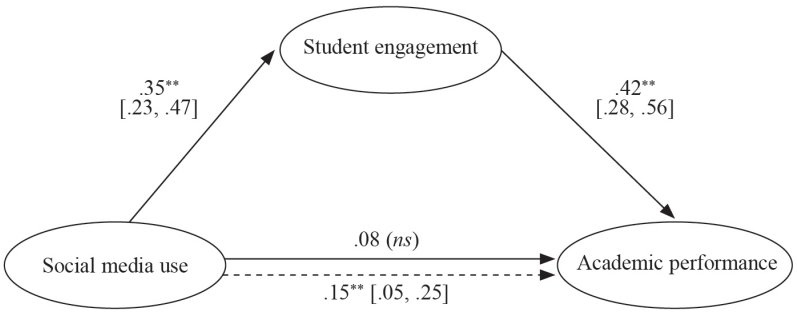

Figure 1. *Path Coefficients of Structural Equation Modeling*

Discussion

Theoretical Implications

We analyzed the relationships between students' social media use, engagement, and academic performance.

Our results show that social media use was positively related to the participants' academic performance through their engagement. Thus, our findings corroborate the full mediating role of student engagement. To our knowledge, we are the first to explore the mediating role of student engagement in linking social media use to Chinese college students' academic performance. In this way, we have added a new facet to the social media use–academic performance relationship.

Previous findings on the effect of social media use on college students' academic performance, which has been discussed in depth, are inconsistent (Junco, 2012; Lambić, 2016; Nwazor & Godwin-Maduike, 2015). By setting and empirically testing our hypotheses, we have contributed to understanding of the relationships between students' social media use, engagement, and academic performance in the context of Chinese higher education. Specifically, we found that social media use was positively related to student engagement. As social media tools promote and enhance student–teacher interaction, the use of social media can motivate college students to engage in learning both on and off campus (Ivala & Gachago, 2012). Second, our finding that student engagement was positively related to academic performance shows that when college students are engaged in learning, their academic achievement is more likely to be enhanced. This finding is consistent with that of Vîrgă et al. (2020), who found a positive link between student engagement and academic performance. Third, our results show that the effect of social media use on academic performance was fully mediated by student engagement. Thus, it is crucial to foster students' engagement in their college study. Students should not use social media unless their teachers ensure they are engaged, because social media use without engagement may not be beneficial.

Practical Implications

From a practical viewpoint, educators should realize the value of social media use in a study context. University teachers wishing to enhance academic performance may be successful if they boost student engagement, and encourage and inspire students' use of social media for academic purposes by actively incorporating social media tools in their academic learning. However, social media use is unlikely to enhance students' academic performance without student engagement.

Limitations and Directions for Future Research

There are some limitations in this study. First, the use of a cross-sectional survey design did not allow for the inference of cause–effect relationships. Future researchers could conduct longitudinal studies to investigate causality. Second, participants were management and business science students only. Future researchers could replicate our study with data from students in other sciences to enhance external validity. Third, a teacher-centered approach is still prevalent in Chinese higher education (Wang, 2014). As Chinese students feel subservient to the teacher, this may be problematic in the e-learning environment when the teacher presence is low (Friesner & Hart, 2004). Thus, future researchers could incorporate teacher engagement into the research model to further explore the relationship between social media use and academic performance.

Conclusion

We identified the mechanism by which social media use is positively related to college student academic performance in a Chinese context. Our results show that social media use enhances academic performance indirectly through increased student engagement. These findings reinforce the value of both social media use and student engagement and show that to improve college student academic performance, educators should pay more attention to students' social media use as well as to their engagement.

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