Journal DOI: 10.36713/epra1013 | SJIF Impact Factor (2024): 8.431 ISSN: 2347-4378
EPRA International Journal of Economics, Business and Management Studies (EBMS)
Volume: 11 | Issue: 10 | October 2024 -Peer-Reviewed Journal

UNLOCKING ACADEMIC SUCCESS IN THE DIGITAL AGE: HOW SOCIAL MEDIA USE, SOCIAL ENGAGEMENT, AND SELF-REGULATION SHAPE UNIVERSITY STUDENTS' PERFORMANCE

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Article DOI: https://doi.org/10.36713/epra18538
DOI No: 10.36713/epra18538

ABSTRACT

In the digital age, social media has become an integral part of university life, influencing students' academic performance and social engagement. This study investigates the relationships between social networking site (SNS) usage, social engagement, self-regulation, and academic performance among Chinese university students. Utilizing a sample of 438 students from a public university, data were collected through a structured questionnaire administered via WeChat and Ding Talk. The analysis employed Partial Least Squares Structural Equation Modeling (PLS-SEM) using SmartPLS version 4.1 to test the proposed hypotheses. The results indicate that SNS usage significantly and positively influences students' academic performance and social engagement. Furthermore, social engagement was found to mediate the relationship between SNS usage and academic performance, suggesting that the benefits of social media extend beyond mere academic collaboration. Additionally, self-regulation was identified as a moderating factor, strengthening the positive impact of SNS usage on academic performance. These findings highlight the importance of leveraging social media as a tool for enhancing academic success while emphasizing the need for self-regulatory skills in navigating digital environments. This study provides valuable insights for educators and policymakers aiming to optimize the academic potential of social media in higher education settings.

KEYWORDS: *Social networking site usage, Social Engagement, Academic Performance, Self-Regulation*

1 INTRODUCTION

The rise of social networking sites (SNS) has been a defining feature of the digital era, fundamentally altering the ways in which individuals communicate, engage, and learn (Ali et al., 2020; Bottaro & Faraci, 2022). Over the past decade, SNS like WeChat, Weibo, QQ, DingTalk, and Douyin among others have become integral to everyday life in China, influencing social, cultural, and academic practices (Ma et al., 2021). Among Chinese university students, these platforms are not only a tool for social interaction but also serve as a space for academic collaboration, news dissemination, and professional networking (Zhang, 2020). While the positive aspects of SNS usage are clear, concerns also remain about the potential impacts on academic performance, particularly given the overwhelming access to distractions and non-academic content (Modi & Jain, 2021; Shahzadi et al., 2021).

More so, the landscape of Chinese higher education is unique in its high levels of digital penetration. According to a report by the China Internet Network Information Center (CNNIC), there were over 1.1 billion internet users in China by mid-2023, with students representing a significant portion of this demographic (Chen & Madni, 2023; Guo, 2024). Given that the majority of Chinese university students own smartphones and other internet-connected devices, SNS usage has become nearly ubiquitous in their daily routines. Students use these platforms not only for personal interactions but also for academic purposes, such as group discussions, sharing academic resources, and networking with peers (Masood et al., 2022). In fact, many universities actively encourage the use of certain platforms like WeChat

for collaborative academic work, enabling seamless communication between students and faculty. However, this widespread use of SNS also raises questions about how these platforms impact students' academic outcomes and the role that factors like social engagement and self-regulation play in mitigating or exacerbating those effects (Guo, 2024; Harwit, 2014).

Social networking sites have transformed from mere tools of communication to central pillars of social and academic life in China. Platforms like WeChat, Weibo, and QQ dominate the social media landscape, with each platform serving different, yet overlapping purposes (Ru Yuan et al., 2023). WeChat, for instance, has evolved into an all-encompassing application used not only for messaging but also for conducting business, transferring money, accessing news, and even engaging in academic discussions through group chats (Wong et al., 2021). Meanwhile, Weibo and Douyin offer avenues for more public engagement, where students can follow academic influencers, engage with trending academic topics, and share information within their networks (Boreham, 2019). This multifaceted nature of SNS makes it a valuable asset for students who wish to enhance their academic knowledge while maintaining social relationships. However, the challenge lies in the balance. Studies indicate that excessive use of SNS, especially for non-academic purposes, can lead to distractions, procrastination, and reduced academic productivity (Kajongwe et al., 2020; Zhang, 2020). Chinese university students often find themselves in a tug-of-war between using these platforms for productive academic engagement and being distracted by the multitude of entertainment options available (Scherr & Wang, 2021; Tang et al., 2021). For instance, Douyin, the Chinese equivalent of TikTok, is a platform known for its short, engaging videos that can quickly captivate a user's attention for extended periods, often at the expense of academic work (Ma et al., 2021; Zhang, 2020). The ease of accessing SNS at any time and place, especially through mobile phones, means that students can quickly lose hours that might otherwise be spent on studying or completing assignments (Anjum et al., 2022). Therefore, understanding the influence of SNS usage on academic performance is critical, especially in a context where digital consumption is deeply integrated into the lives of Chinese university students.

Furthermore, academic performance is a multidimensional construct often measured by a combination of factors such as grades, study habits, and perceived academic success (Alshanqiti et al., 2023). While academic success remains the primary goal for many university students, various internal and external factors affect how students perform. The relationship between SNS usage and academic performance is complex and has been the subject of numerous studies (Anjum et al., 2024). On one hand, SNS can facilitate learning by allowing students to exchange ideas, collaborate on projects, and access academic resources with greater ease. On the other hand, excessive or improper use of SNS, especially for entertainment purposes, can detract from study time, reduce concentration, and lead to poor academic outcomes (Le Thanh Tung, 2022; Samuel, 2023). In the Chinese educational context, where academic achievement is highly prioritized and competition is intense, understanding the nuances of this relationship becomes even more critical. The immense pressure placed on students to excel academically, coupled with the demands of modern university life, means that any potential negative influences on academic performance—such as excessive SNS use—can have far-reaching consequences even though SNS also affects academic performance positively (Javeed, 2023; Ji & Pang, 2023). Chinese university students face long hours of study, strict coursework deadlines, and a highly competitive job market, making efficient time management and focus essential for success. However, the ever-present allure of social networking sites presents a challenge to maintaining these academic priorities.

In addition, social engagement refers to the ways in which individuals participate and connect with others within a community. For university students, social engagement often encompasses interactions with peers, involvement in academic groups, and collaboration on class projects. In many ways, SNS provides students with opportunities to engage socially and academically (Shafiq & Parveen, 2023). Group chats on WeChat, for instance, are frequently used for academic discussions, sharing class notes, or clarifying concepts that were difficult to understand during lectures. Additionally, many Chinese universities have established official WeChat accounts to distribute academic resources and information, making SNS an essential academic tool (Chu & Yang, 2020). Despite these positive uses, not all social engagement on SNS contributes to academic success. Many students may spend excessive amounts of time engaging in non-academic social activities, such as chatting with friends, following influencers, or consuming entertainment content. The balance between academic and non-academic social engagement is crucial in determining the overall impact of SNS on academic performance (Anjum et al., 2024). By serving as a mediator, social engagement can either amplify the positive effects of SNS (through academic collaboration and resource-sharing) or exacerbate the negative effects (through distractions and time-wasting activities). Thus, understanding how social engagement mediates the relationship between SNS usage and academic performance is a key focus of this study.

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Moreover, self-regulation refers to an individual's ability to manage and control their behaviors, emotions, and thoughts, particularly in the pursuit of long-term goals (Daniela, 2015). In the academic context, self-regulation is critical for managing time, maintaining focus, and resisting distractions—skills that are particularly relevant when students are constantly exposed to the potential distractions of SNS (Reinecke et al., 2022). Chinese university students, who are often under immense pressure to perform well academically, need strong self-regulation skills to balance the demands of their studies with the pervasive nature of social media (Boreham, 2019). While some students may use SNS effectively for academic purposes, others may struggle to regulate their usage, leading to decreased study time, procrastination, and ultimately poorer academic outcomes (Scherr & Wang, 2021; Tang et al., 2021). Self-regulation acts as a moderator in the relationship between SNS usage and academic performance. For students with high levels of self-regulation, the negative impacts of SNS on academic performance may be mitigated. These students may be able to use SNS for productive academic purposes while limiting their engagement in distracting, non-academic content. Conversely, students with low self-regulation may find it difficult to resist the temptations of social media, allowing SNS usage to interfere with their studies. By examining self-regulation as a moderating factor, this study seeks to determine how individual differences in self-control influence the overall relationship between SNS usage and academic success.

The purpose of this study is to examine the impact of social networking site usage on academic performance among Chinese university students, with a particular focus on the mediating role of social engagement and the moderating effect of self-regulation. This study contributes to the growing body of literature on SNS and academic performance by focusing on a Chinese student population, a group that is often underrepresented in global studies despite their heavy engagement with SNS. Moreover, by introducing social engagement and self-regulation into the model, this study provides a more nuanced understanding of the factors that influence the relationship between SNS usage and academic outcomes.

2 LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

2.1 The impact of social networking sites usage on academic performance

Social networking sites (SNS), such as Facebook, Instagram, Twitter, and TikTok, have become integral parts of students' daily lives (Ji & Pang, 2023; Shafiq & Parveen, 2023). As technology has evolved, the accessibility of these platforms has expanded, leading to extensive use among university students for both academic and non-academic purposes (Ali et al., 2020; Raza et al., 2020). The relationship between SNS usage and academic performance has been widely debated, with researchers exploring the impact of various factors such as time spent on SNS, the nature of use (academic vs. social), and students' self-regulation skills.

Several studies highlight the potential benefits of SNS on academic performance. Social networking platforms, especially those designed for academic collaboration (such as LinkedIn, Google Classroom, and academic Facebook groups), can foster learning by providing a space for discussions, resource sharing, and collaboration (Jordan & Weller, 2018; Kazam et al., 2023). According to Shafiq & Parveen (2023), SNS can enhance students' learning experiences by offering them access to resources and facilitating communication with peers and instructors. Such platforms often act as supplementary learning environments where students can ask questions, clarify doubts, and share educational materials in real time. Moreover, Javeed (2023) and Ji & Pang (2023) argue that social media may also help students stay updated with relevant academic events such as webinars, conferences, or guest lectures. Some SNS platforms have also adapted by introducing specific features to support learning, such as live-streaming lectures or creating academic groups (Masood et al., 2022). This aspect is particularly relevant in a digital age where blended learning models are becoming more common. Studies further indicate that SNS can contribute to the development of soft skills that indirectly impact academic performance. For instance, Alshanqiti et al. (2023) found that students who engage with their peers on SNS platforms develop stronger communication and collaboration skills, which are essential for group projects and other academic activities. These interactions can lead to higher levels of academic motivation and engagement, contributing to improved academic outcomes.

Despite these potential advantages, a larger body of research suggests that excessive SNS usage can negatively affect academic performance. A prominent concern is that students tend to spend a significant amount of time on non-academic activities on SNS, such as entertainment, socializing, and gaming, which may lead to procrastination and distraction from their studies (Hameed et al., 2022; Javeed, 2022). A study conducted by Dimacangun & Guillena (2023) and Ejoh & Lawan (2022) showed that students who spend excessive time on social platforms report lower GPAs compared to their counterparts who limit their usage. The research suggests that SNS usage can encourage

multitasking, which reduces students' ability to focus deeply on academic work, leading to cognitive overload and diminished academic performance. More so, time displacement is another major issue associated with SNS usage. Many students report spending multiple hours on social platforms during study time, which reduces the amount of time available for academic tasks (Kazam et al., 2023). Additionally, SNS usage may lead to poor sleep patterns, which, in turn, negatively impacts academic performance. A study by Javeed (2022) indicates that students who use SNS late at night often experience sleep deprivation, leading to reduced concentration, memory, and cognitive function during class or study sessions.

Despite the negative reputation often associated with social media, students commonly spend their free time on platforms like Facebook, Twitter, and Instagram. While social media usage can yield both positive and negative effects, studies have revealed a notable connection between social media engagement and academic performance (Anjum et al., 2024; Ji & Pang, 2023). Research conducted by Shafiq & Parveen (2023) identified an inverse relationship between the two, showing that excessive social media usage can hinder academic progress. Although social media offers students the opportunity to acquire knowledge and social skills outside the classroom, overuse can interfere with their academic responsibilities. However, when used effectively, technology can be a valuable resource, particularly during the global pandemic when mobile devices have become essential for academic work, as noted by Scherr & Wang (2021). Technological advancements have made social media immensely popular across the globe, and students, in particular, dedicate significant time to these platforms. Dimacangun & Guillena (2023) highlighted this in their research, which showed that excessive use can negatively impact students' academic pursuits, advocating for reduced social media use to improve productivity.

In the context of education's "new normal," Alshanqiti et al. (2023) examined how social media affects students' academic outcomes. Their findings, based on analyzing questionnaire subscale scores, indicate that social media can have a positive effect on academic performance. Despite the pervasive use of social media among students, its benefits appear to outweigh its drawbacks. Moreover, the study found no substantial difference between the positive and negative impacts of social media on academic achievement. As a result, Mosharrafa et al. (2024) argue that both educators and students can harness social media as a tool for information sharing and communication to enhance learning outcomes. Despite the positive and negative ramifications of SNS usage espoused, the following hypothesis is proposed:

H1: There is a positive relationship between SNSs usage and academic performance among Chinese university students.

2.2 The impact of social networking sites usage on social engagement

Social networking sites such as Facebook, Instagram, Twitter, and TikTok, have revolutionized how individuals engage socially, creating new avenues for communication, connection, and interaction (Masciantonio & Bourguignon, 2023). SNS provide platforms where users can build and maintain social networks, share content, and participate in discussions that span across geographic and cultural boundaries (Jordan & Weller, 2018; Shafiq & Parveen, 2023). The concept of social engagement, which includes active participation in community activities, social interactions, and fostering a sense of belonging, has been transformed by the pervasive influence of these platforms (Jordan & Weller, 2018). The literature on SNS usage and social engagement offers various perspectives, identifying both positive and negative outcomes.

Many scholars argue that SNS plays a positive role in enhancing social engagement. SNS provides a virtual space for individuals to connect, communicate, and engage in various social activities (Kajongwe et al., 2020). Jordan & Weller (2018) propose that SNS facilitate the formation and maintenance of social capital, resources gained through social connections, which are integral to community engagement. Their study found that users who actively participate in social networks tend to have stronger ties with friends, family, and their communities. These connections often foster deeper involvement in social causes, community projects, and public discourse. Furthermore, SNS provides a platform for marginalized groups to engage socially. In a study by Shafiq & Parveen (2023), it was found that individuals who face geographical or social isolation use SNS to build and maintain social ties. This increased access allows people who may not traditionally participate in social events or activities to be included in discussions and engagements. Online communities on SNS serve as support networks where individuals can share experiences, seek advice, and develop meaningful relationships, further enhancing their social engagement (Jordan & Weller, 2018).

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SNSs also enable users to participate in online activism, also known as "slacktivism." Although some critics argue that this form of participation is passive, others contend that online activism is an important gateway to deeper social engagement (Boreham, 2019; Kajongwe et al., 2020). Studies have shown that participating in online petitions, sharing information about social issues, or joining social movements on SNS often encourages users to become more involved in offline activities (Lim & Rasul, 2022). Therefore, SNS can be seen as a tool that bridges the gap between online and offline social engagement, contributing to greater involvement in civic and community life. Based on the argument espoused, the following hypothesis is proposed:

H2: There is a positive relationship between active SNS usage and social engagement among university students.

2.3 The mediating role of social engagement

Numerous studies have investigated the impact of SNS usage on various aspects of students' lives, particularly academic performance, but the results remain mixed (Dimacangun & Guillena, 2023; Hameed et al., 2022). Some scholars have argued that excessive use of SNS can lead to poor academic outcomes due to distractions, procrastination, and time mismanagement (Reinecke et al., 2022; Zimba & Gasparyan, 2021). However, others suggest that SNS can facilitate academic engagement by fostering collaborative learning, enabling students to exchange educational resources, and enhancing social interaction among peers and instructors (Elhusseini et al., 2022; Masood et al., 2022). The complexity of this relationship calls for a more nuanced understanding, particularly regarding the mediating role of social engagement.

Social engagement refers to active participation in social and academic communities, both online and offline, that can influence learning and overall academic success (Jordan & Weller, 2018). Social engagement on SNS can manifest in various ways, such as joining academic groups, participating in discussions, sharing educational content, or seeking peer support (Clark et al., 2018; Rfeqallah et al., 2021). When students use SNS for academic purposes, they engage in peer-to-peer interactions, where ideas are exchanged, feedback is provided, and mutual support is offered (Moreno-Munoz et al., 2016). This type of social engagement has the potential to create a sense of community and belonging, which are factors that significantly impact student motivation and learning outcomes (Dimacangun & Guillena, 2023; Shafiq & Parveen, 2023). Several studies have demonstrated that social engagement positively influences academic performance. For instance, Danişman (2017) found that students who are more socially engaged are better able to navigate the academic environment and manage educational challenges. Moreover, SNS provides an avenue for social support and collaborative learning, which can strengthen students' academic skills. For example, studies by Ainin et al. (2019) and Al-Rahmi et al. (2018) show that SNS use, when coupled with academic-related engagement, leads to better performance outcomes because students can clarify doubts, share learning materials, and discuss academic topics.

Social engagement can act as a mediator between SNS usage and academic performance, meaning that the extent to which students engage socially on these platforms can either enhance or hinder their academic success. While some students may use SNS primarily for socialization and entertainment, leading to lower academic achievement, others may leverage these platforms for academic collaboration and support, which in turn enhances their academic performance (Anjum et al., 2024; Khaola et al., 2022). The quality of social interactions on SNS is crucial; engagement that promotes academic discourse and group study can help students develop problem-solving skills and critical thinking, which are essential for academic success (Koranteng et al., 2019; Riaz et al., 2023). In addition, SNS can enhance academic motivation by connecting students with communities of like-minded peers who encourage learning and provide positive reinforcement (Ejoh & Lawan, 2022). This social integration fosters a positive learning environment, which enhances academic engagement and, ultimately, academic performance. However, it is important to note that the effect of social engagement on academic performance through SNS usage can vary based on the intensity and purpose of the engagement. Excessive engagement in non-academic activities on SNS can have a detrimental effect on academic performance, as it leads to distractions and reduced study time (Paul et al., 2022). Based on the argument, we propose the following:

H3: Social engagement mediates the relationship between SNSs usage and academic performance.

2.4 The moderating role of self-regulation

While some studies suggest that SNS usage can negatively affect academic outcomes due to distractions, time mismanagement, and procrastination (Sakhieva et al., 2024), others argue that when used appropriately, SNS can enhance academic collaboration and information sharing (Javeed, 2023). However, one factor that may help explain

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these differing outcomes is students' self-regulation, which could moderate the relationship between SNS usage and academic performance.

Self-regulation refers to an individual's ability to control their behavior, emotions, and thoughts in pursuit of long-term goals (Daniela, 2015). In an academic context, self-regulation is essential for managing time, setting goals, maintaining focus, and resisting distractions, especially in environments filled with potential interruptions (Rodríguez et al., 2022), such as SNS (Pintrich, 2015). Self-regulated learners tend to plan, monitor, and evaluate their learning activities, leading to better academic outcomes (Reinecke et al., 2022). They are better equipped to handle the temptations of social media, as they can regulate their usage and avoid overindulgence in non-academic activities (Zee & De Bree, 2017). In contrast, students with lower levels of self-regulation may struggle to manage their time effectively when using SNS, leading to procrastination and reduced study time, which in turn, can negatively affect their academic performance. Moreover, the impact of SNS usage on academic performance depends largely on how students utilize these platforms. When used for academic purposes, such as participating in study groups, sharing resources, or discussing course content, SNS can enhance academic engagement and foster a sense of community among students (Al-Rahmi et al., 2015). However, when SNS are used primarily for entertainment or socializing, they can become a source of distraction, leading to decreased focus on academic tasks and poorer performance outcomes (Khaola et al., 2022; Kizgin et al., 2019). The dual nature of SNS highlights the importance of self-regulation in determining whether SNS usage will result in positive or negative academic outcomes.

Self-regulation may act as a moderating factor in the relationship between SNS usage and academic performance. Specifically, students with high levels of self-regulation are likely to use SNS in a way that supports their academic goals, such as engaging in productive academic discussions, managing their time effectively, and avoiding non-academic distractions. These students are more likely to benefit from the positive aspects of SNS usage, such as increased collaboration and access to academic resources (Zee & De Bree, 2017). On the other hand, students with low levels of self-regulation may find it difficult to resist the distractions posed by SNS, leading to excessive usage for non-academic purposes, reduced study time, and ultimately poorer academic performance. Research has shown that self-regulation can influence how students interact with digital tools, including SNS (Panadero, 2017). Highly self-regulated learners are more adept at balancing their academic and social life, using SNS for productive purposes while minimizing time spent on non-academic activities (Zee & De Bree, 2017). As a result, self-regulation serves as a critical factor in determining the extent to which SNS usage influences academic outcomes. Students with strong self-regulation skills can mitigate the negative effects of SNS on academic performance, while those with weaker self-regulation may experience adverse academic consequences.

H4: Self-regulation moderates the relationship between SNSs usage and academic performance, such that the positive effect of SNS usage on academic performance is stronger for students with high levels of self-regulation.

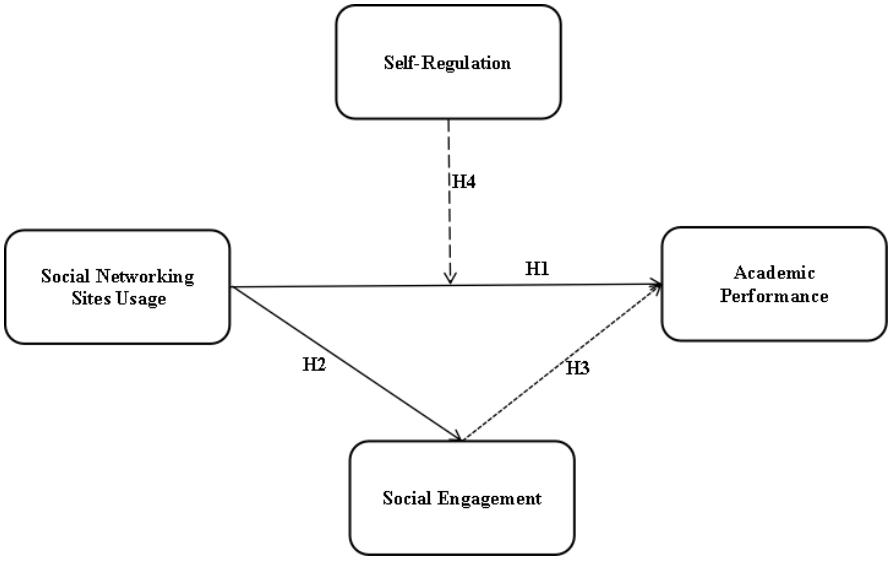


Figure 1 Conceptual framework

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3 METHODOLOGY

3.1 Research Design and Instrument

This research utilized a quantitative survey approach for data collection. The research team developed an online questionnaire to test the proposed hypotheses. The survey began with an introductory section explaining the purpose of the study to participants. It was organized into two main parts: the first gathered demographic data, while the second focused on the measurement items related to the study's key variables. The questionnaire included several elements to measure the four primary variables in the model: social networking site usage, social engagement, academic performance, and self-regulation. The items used to evaluate these variables were adapted from previous studies, with all items validated in the existing literature. A 5-point Likert scale was used to measure each variable, ranging from 1 (strongly disagree) to 5 (strongly agree). Table 1 presents a summary of the study's constructs, their associated notations, and the sources from which they were adapted.

Table 1 Measurement of Constructs

Constructs	Notations	No. of Items	Literature Sources
Social Networking Site Usage	SNS	5	(Sigerson & Cheng, 2018)
Social Engagement	SE	5	(Lin, 2017)
Academic Performance	AP	5	(Gibson & Rankin, 2015)
Self-Regulation	SR	5	(Zimmerman, 2000)

3.2 Data Collection, Sampling, and Analysis Procedure

To address the identified research gaps, the study focused on a sample of Chinese university students in a public university in Hangzhou, Zhejiang Province, China. Participants were selected using convenience sampling to target the relevant study population effectively. The questionnaire was distributed over a five-week period through WeChat and Ding Talk, with support from some lecturers from the school. The questionnaire was drafted in English and converted into Chinese with the help of three Chinese doctorate students who had their undergraduate and master studies in the USA and, hence, had greater ability in English. After the administration, it was translated back into English to aid in the data processing. Out of 482 questionnaires sent, 438 were returned and used in the study, yielding a high response rate of 91%. This sample size meets the requirements for conducting exploratory factor analysis (EFA), confirmatory factor analysis (CFA), and structural equation modeling (SEM), as outlined by Hair et al. (2019). For data analysis, the study used Smart-PLS 4.1 software. As noted by Hair et al. (2019), Smart-PLS is ideal for providing reliable estimates, particularly when dealing with both simple and complex models, large sample sizes, and primary data. The Partial Least Squares Structural Equation Modeling (PLS-SEM) approach was utilized to test and validate the hypothesized relationships between the variables. This method is popular across multiple academic fields due to its effectiveness in analyzing research models and relationships (Sharif et al., 2019) and its usefulness for theory building and extension (Shmueli et al., 2019). The analysis proceeded in two stages. First, the constructs' reliability and discriminant validity were evaluated. Following that, the structural model was examined to assess the hypothesized relationships, allowing for data-driven conclusions based on the established assumptions.

4 RESULTS PRESENTATION

4.1 Sample Characteristics

Among the 265 respondents, the majority are male, comprising 178 individuals (67.2%), while females make up a smaller portion with 87 participants (32.8%), as illustrated in Figure 2. More so, with educational level, 319 (72.8%) of participants were undergraduate students, 92 (21%) were master students, and 27 (6.2%) were PhD students.

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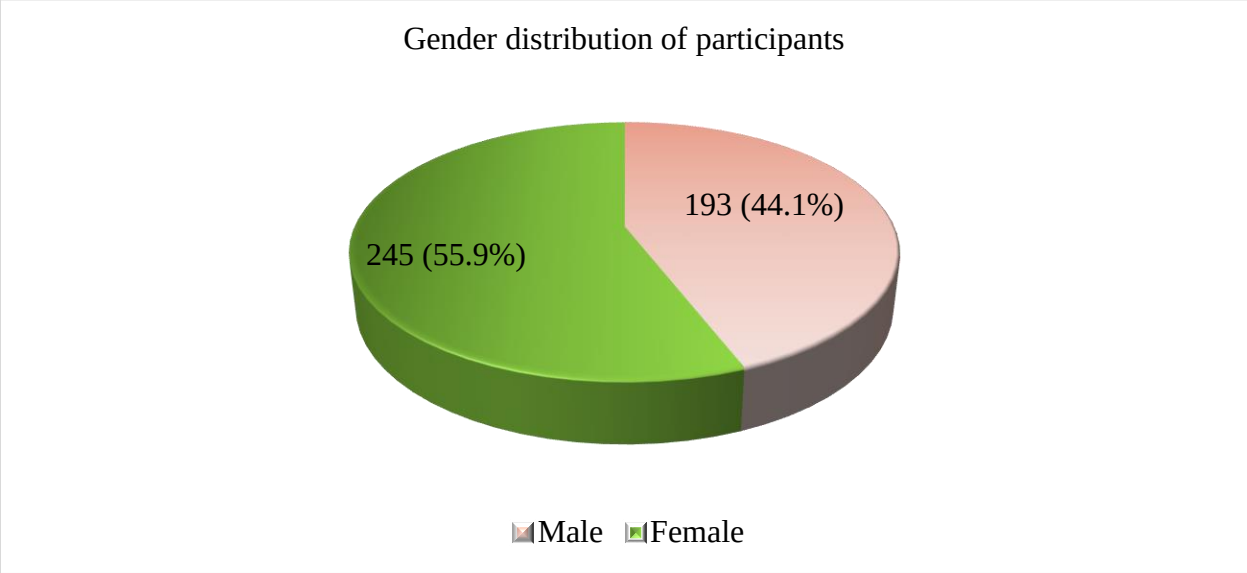


Figure 2 Gender Distribution of Participants

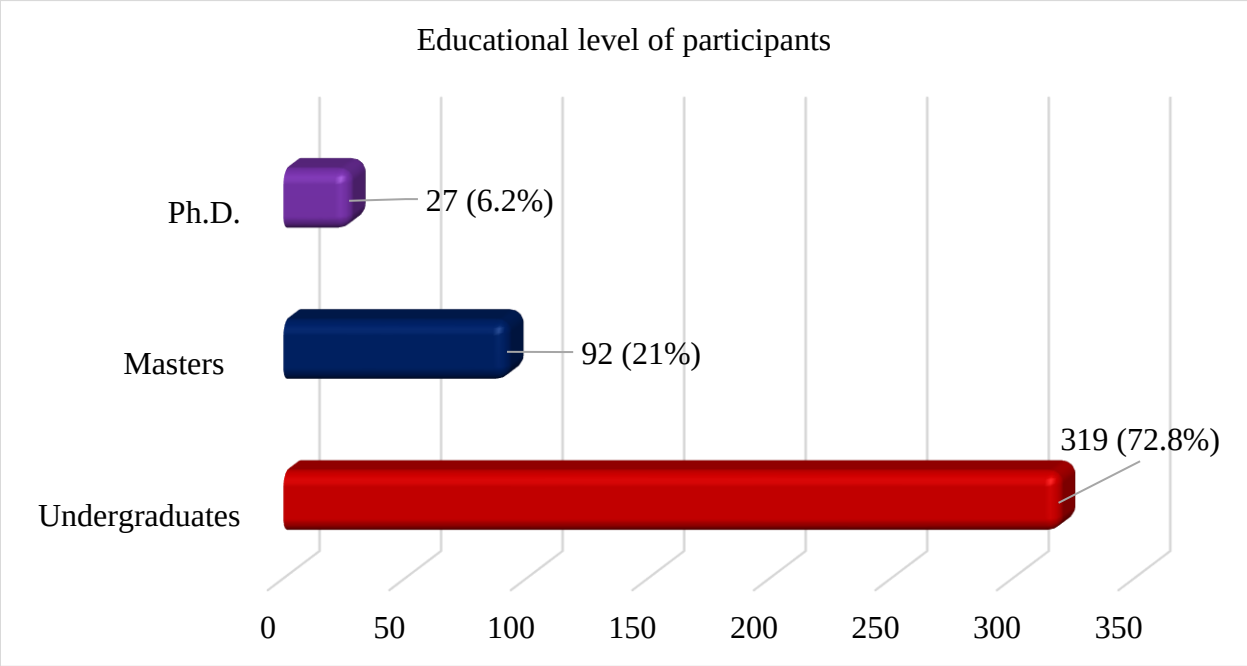


Figure 3 The Education Level of the Participants

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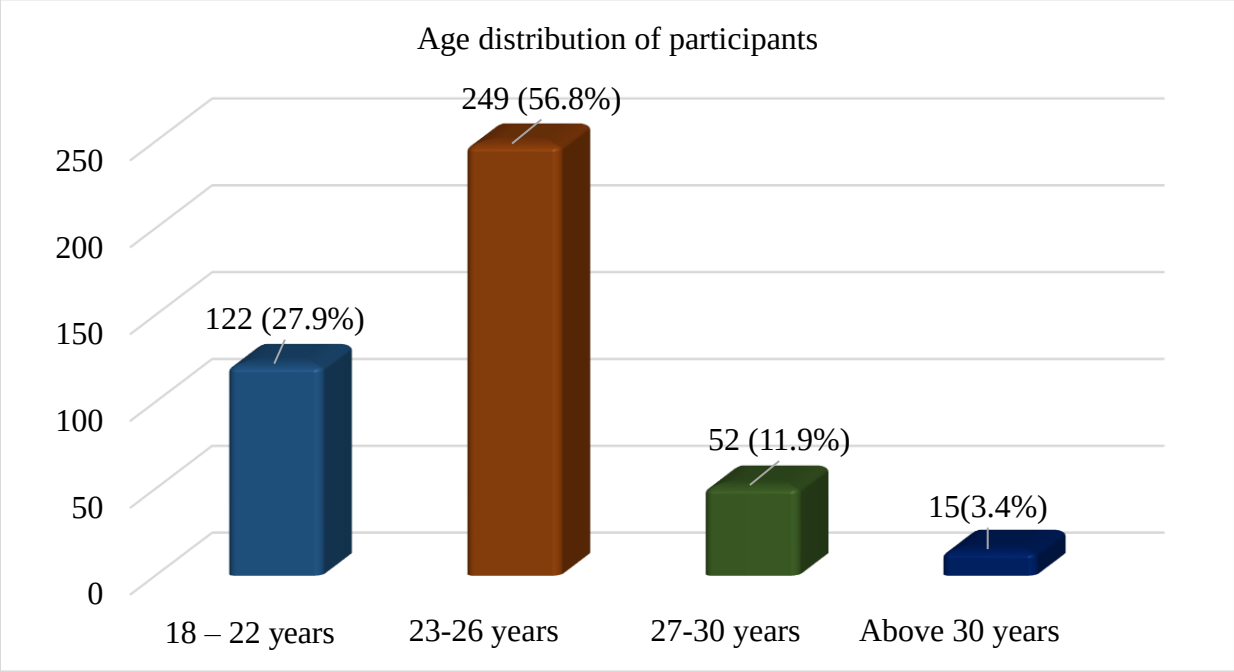


Figure 4 Age Distribution of Respondents

The majority of participants, representing 56.8% (249 individuals), are in the 23–26 age range. A significant portion, 27.9% (122 individuals), belongs to the 18–22 age group. Furthermore, 11.9% (52 participants) are between the ages of 27 and 30, while 3.4% (15 participants) are over 30 years old. Refer to Figure 4 for details.

According to the results in Figure 5, WeChat is the most popular social media platform among respondents, with 438 respondents indicating it as one of their preferred platforms. This is followed closely by Bilibili with 405 participants, showing a strong interest in video content and entertainment among the participants. Renren and QQ also see significant engagement, with 315 and 302 students, respectively. These platforms, known for their role in social networking and communication, still maintain a considerable user base. Douyin, the Chinese version of TikTok, is also highly favored with 288 respondents, highlighting the growing popularity of short-form video content. Weibo, a microblogging platform, follows with 207 respondents. Smaller but notable platforms like Xiaohongshu (187 participants), Douban (152 respondents), Kuaishou (171 participants), and Zhihu (92 participants) also have dedicated user groups, though their numbers are relatively lower compared to the top platforms. Overall, the result suggests a preference for multi-functional platforms like WeChat and content-focused sites like Bilibili and Douyin, reflecting diverse user interests in communication, entertainment, and media consumption.

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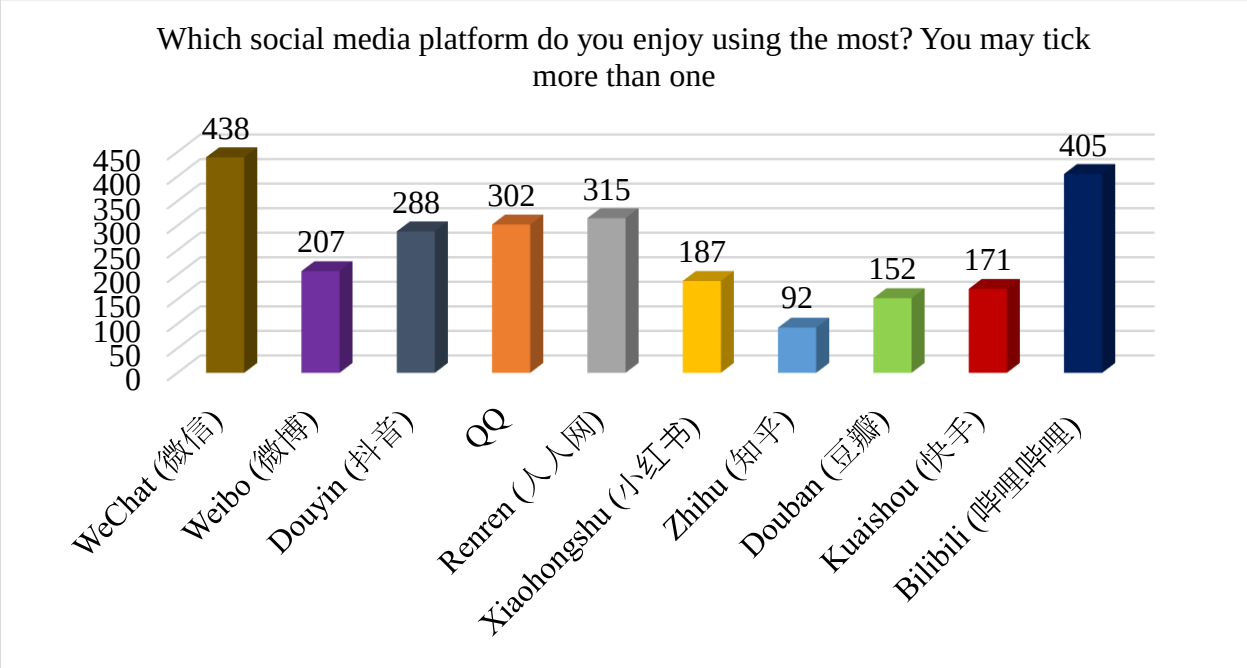


Figure 5 Preferred Social Media Platforms Among Chinese Students

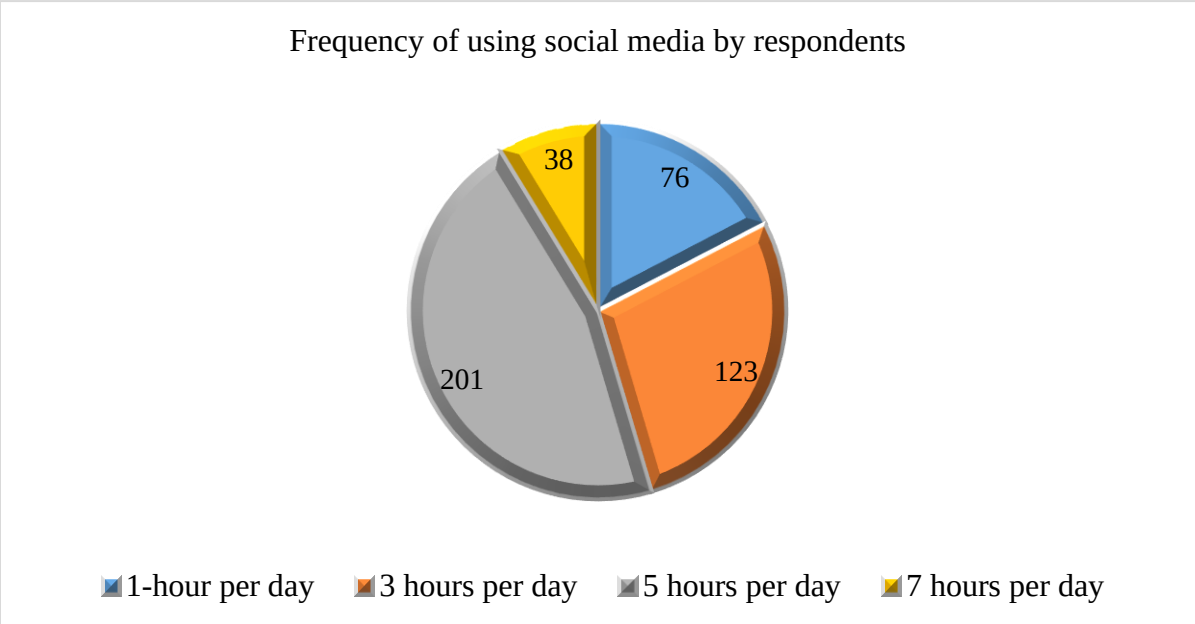


Figure 6 Frequency of Using Social Media by respondents

Figure 6 reveals varying levels of social media engagement among respondents. A moderate group of 123 respondents spends 3 hours daily on social media, likely reflecting balanced users who incorporate social platforms into their routine without excessive use. The largest group, 201 respondents, spends 5 hours per day, indicating more intensive interaction and consumption, with social media playing a significant role in their personal or academic lives. Meanwhile, the smallest group, 38 respondents, reports 7 hours of daily usage, suggesting highly immersive or potentially addictive behavior, which may raise concerns about its impact on their offline activities and academic performance.

Journal DOI: 10.36713/epra1013 | SJIF Impact Factor (2024): 8.431 ISSN: 2347-4378
EPRA International Journal of Economics, Business and Management Studies (EBMS)
Volume: 11 | Issue: 10 | October 2024 -Peer-Reviewed Journal

The reasons for using social networking sites among respondents reveal a wide range of activities, highlighting the platforms' multifunctional nature. The most common purpose, with 438 respondents, is texting and chatting, indicating that SNS remains a vital tool for communication and staying connected. Academic work follows closely with 407 respondents, underscoring the growing importance of SNS in educational and collaborative contexts. Downloading videos (395 respondents) and watching movies (349 respondents) also rank high, reflecting the popularity of SNS as a source of entertainment. Lastly, listening to music attracts 311 respondents, further showcasing the diverse ways people engage with SNSs, blending communication, work, and leisure activities seamlessly into one platform. See Figure 7.

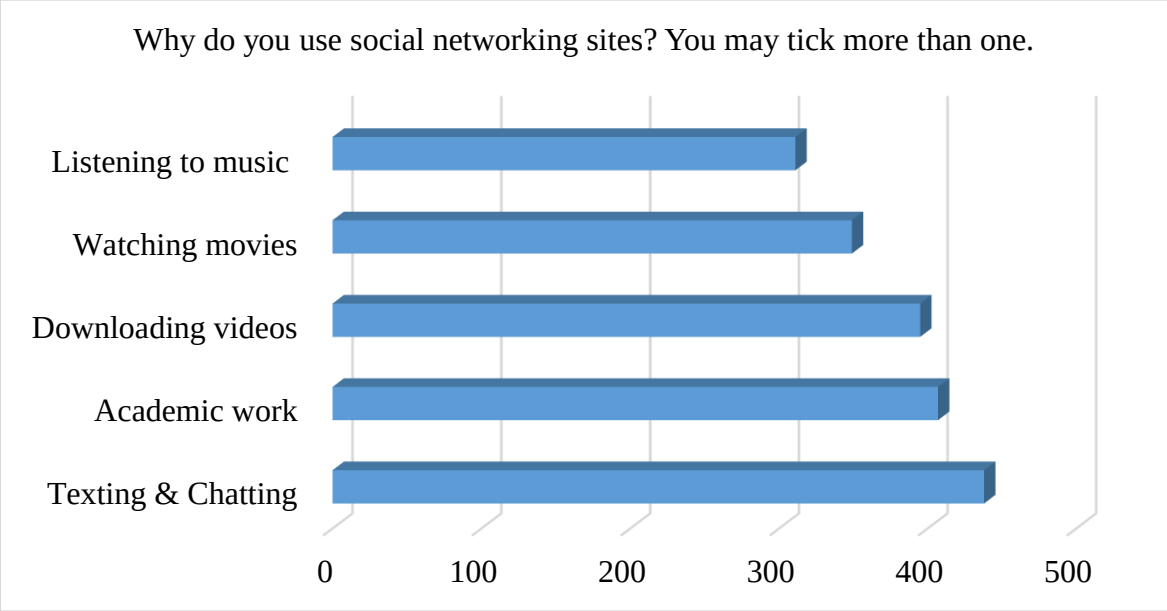


Figure 7 Uses of SNSs by Respondents

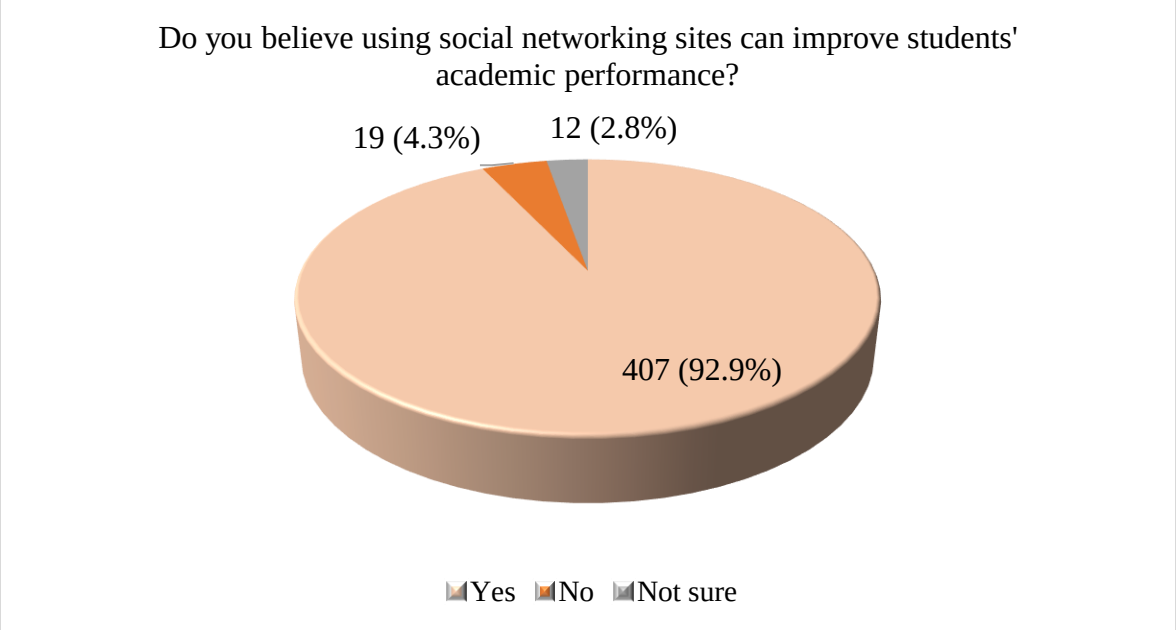


Figure 8 Social media as a catalyst for academic success

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The overwhelming majority of respondents, 407 (92.9%), believe that using social media can enhance students' academic performance, highlighting the potential of these platforms as valuable educational tools. This perspective likely stems from the role of SNS in facilitating collaboration, information sharing, and access to academic resources. A small minority, 19 respondents (4.3%), disagrees, possibly due to concerns about distractions or misuse of these platforms. Meanwhile, 12 respondents (2.8%) are unsure, reflecting some uncertainty about whether the benefits of SNS in education outweigh the potential drawbacks. Overall, the result suggests strong confidence in SNSs' ability to support academic success. See Figure 8.

4.2 Measurement Model Assessment

The study commenced with an evaluation of crucial parameters to assess the adequacy of the measurement model and confirm its internal consistency. Measures of reliability and validity were calculated, and the findings are detailed in Tables 2, 3, and 4, which illustrate the fitness indicators of the model. These indicators include standardized factor loadings (λ), variance inflation factor (VIF), Cronbach's alpha (α), composite reliability (CR), and average variance extracted (AVE) for all four variables. The standardized factor loadings (λ) for the four constructs all exceed the recommended threshold of 0.6, as indicated by (Hair et al., 2011). Furthermore, Cronbach's alpha (α) values surpass the 0.7 threshold (Hooper et al., 2008), reflecting the robust reliability of the measurement items. The AVE values for all variables exceed the benchmark of 0.5, confirming convergent validity (Hair et al., 2019). The composite reliability scores for the four variables range from 0.858 to 0.874, surpassing the accepted standard of 0.7 (Hair et al., 2011). Additionally, VIF values are all below 5, indicating that multicollinearity is not a concern (Hair et al., 2011). In summary, the results confirm that the measurement model exhibits a strong fit, with measurement items that are both valid and reliable.

Table 2 Reliability of items and constructs

Constructs	Notations	VIF	Loadings (λ)	Cronbach alpha (α)	CR	AVE
Social Networking Site Usage (SNS)	SNS1	2.952	.905	0.858	0.867	0.660
	SNS2	2.138	.829			
	SNS3	1.813	.843			
	SNS4	2.015	.750			
	SNS5	1.474	.722			
Social Engagement (SE)	SE1	1.613	.852	0.877	0.874	0.689
	SE2	1.689	.770			
	SE3	1.240	.783			
	SE4	1.417	.873			
	SE5	1.512	.866			
Self-Regulation (SR)	SR1	1.410	.768	0.886	0.858	0.647
	SR2	1.639	.794			
	SR3	1.600	.859			
	SR4	1.489	.848			
	SR5	1.539	.748			
Academic Performance (AP)	AP1	1.574	.765	0.881	0.871	0.671
	AP2	2.125	.847			
	AP3	2.183	.849			
	AP4	2.003	.866			
	AP5	2.115	.762			

Note: α = Cronbach alpha: λ = standardized factor loadings; CR = composite reliability; VIF = variance inflation factor; AVE = average variance extracted.

The study further examined the validity of the measurement model by evaluating discriminant validity to ensure that there was no overlap among the items. To accomplish this, two widely recognized methods were used: the Fornell-Larcker criterion and the Heterotrait-Monotrait Ratio (HTMT), as suggested by Henseler et al. (2015). Discriminant validity was validated through the Fornell-Larcker method, as illustrated in Table 3, which showed that the correlations between constructs were lower than the square root of their respective average variance extracted (AVEs). All results adhered to the standard of being less than 0.85. Additionally, the HTMT values presented in Table 4 were all under

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0.90, thereby meeting the necessary threshold for discriminant validity. These findings collectively affirm the reliability and discriminant validity of the constructs, as detailed in Tables 3 and 4.

Table 3 Discriminant Validity - Fornell-Larcker Criterion

Constructs	SNS	SE	SR	AP
Social Networking Site Usage	**0.812**			
Social Engagement	0.296	**0.830**		
Self-Regulation	0.324	0.479	**0.805**	
Academic Performance	0.263	0.284	0.370	**0.819**

Table 4 Discriminant Validity - Heterotrait-Monotrait Ratio (HTMT) Criterion

Constructs	3PL-AS	LOP	LTV	TMB
Social Networking Site Usage				
Social Engagement	0.796			
Self-Regulation	0.723	0.748		
Academic Performance	0.737	0.725	0.603	

Note: *Shaded boxes represent the modes of reporting HTMT. The diagonal values (in bold) indicate the square root of the average variance extracted (AVE), while the off-diagonal values represent the correlations among the variables.*

4.3 Hypotheses Evaluation

Using the bootstrapping method outlined by Shmueli et al. (2019), PLS regression was employed to evaluate both direct and moderating effects while testing the study's hypotheses. The findings related to the direct relationships revealed statistically significant results, as presented in Table 5 and Figure 9. The results show that SNS usage (β =0.185, t=5.046, p<0.000) influenced academic performance positively and significantly. More so SNS usage influences the social engagement of students positively and significantly as well (β =0.418, t=26.125, p<0.000). Based on the outcome, H1 and H2 were accepted.

Moreover, the outcome indicated that SNS usage indirectly influences students' academic performance through social engagement (β =0.101, t=4.809, p<0.000). Relying on Nitzl et al. (2016), when the indirect effect (0.101) is divided by the total effect (0.287) of SNS usage, the mediation identified here is a partial mediation (35.5%%). Given this result, H3 is accepted.

Table 5 Path Assessment

	Original sample (O)	**Sample mean (M)**	**Standard deviation (STDEV)**	**T statistics (|O/STDEV|)**	**P values**
SR -> AP	0.452	0.449	0.048	9.362	0.000
SE -> AP	0.243	0.244	0.05	4.894	0.000
SNS Usage -> AP (H1)	0.185	0.188	0.037	5.046	0.000
SNS Usage -> SE (H2)	0.418	0.415	0.016	26.125	0.000
SNS usage -> SE -> AP (H3)	0.101	0.102	0.021	4.809	0.000
SR x SNS Usage -> AP (H4)	0.072	0.072	0.017	4.202	0.000

Note: * T-value >1.96, ***p<0.001, **p<0.01, *p<0.05.

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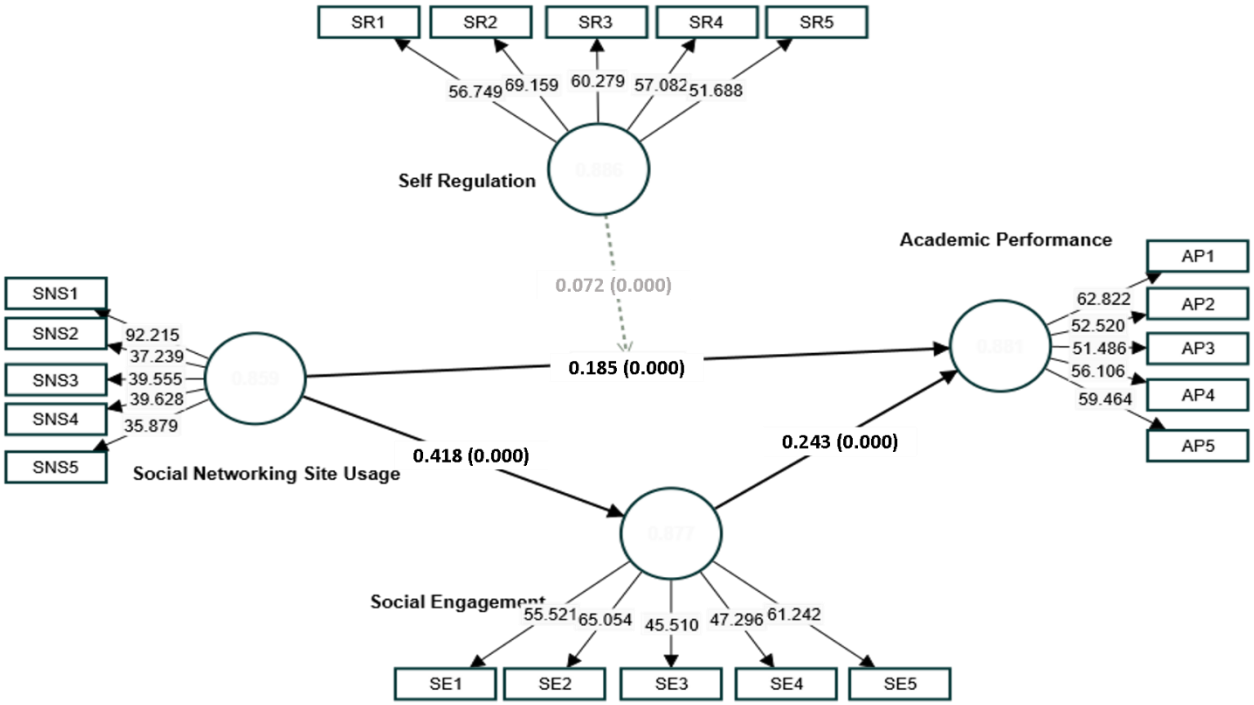


Figure 9 Bootstrapping Output

Lastly, the study indicated that self-regulation moderates the nexus between SNS usage and the academic performance of Chinese students. Table 5 shows that the interaction or product term between SNS usage and self-regulation is (β =0.072, $p<0.001$). By implication, self-regulation amplifies the positive effect of SNS usage on academic performance. The diagram that shows this moderation is covered in Figure 10. Given the outcome, H4 was accepted.

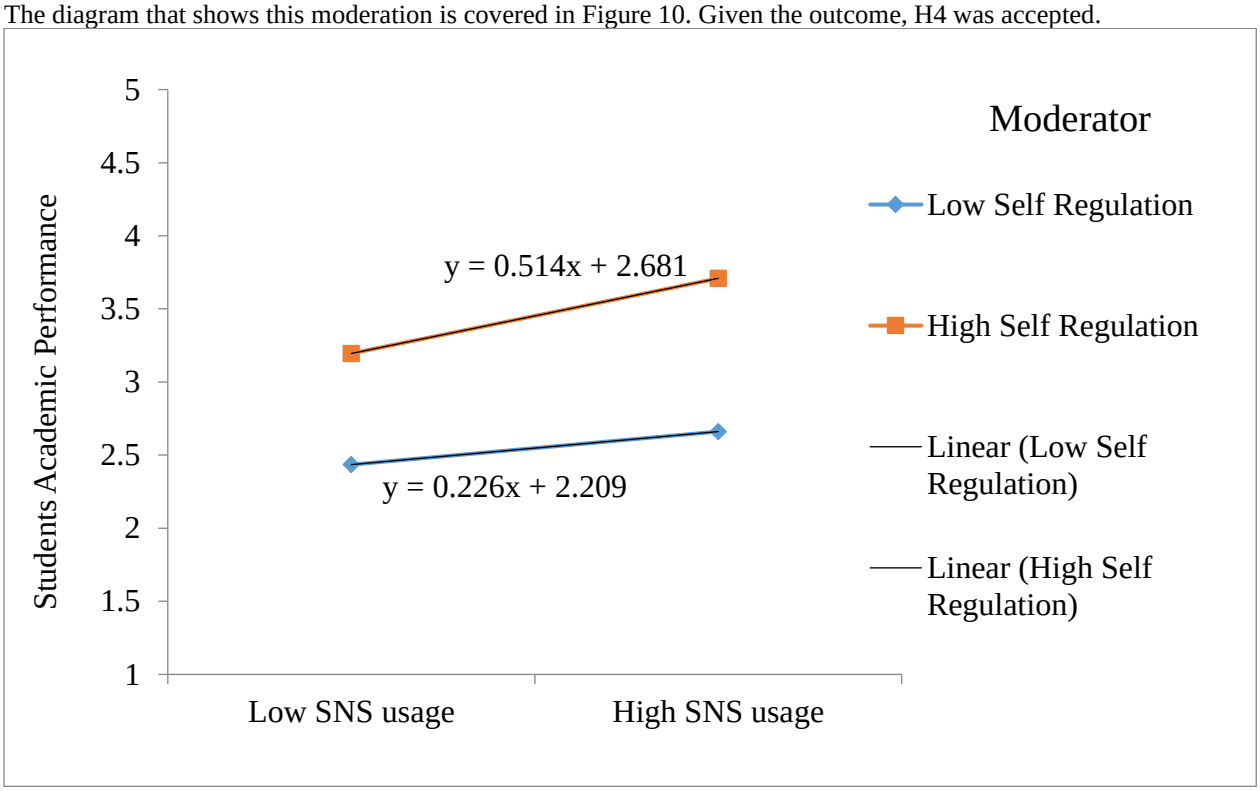


Figure 10 Self-regulation strengthens the positive relationship between SNS usage and students' academic performance.

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5 DISCUSSION

The findings from the study of Chinese university students regarding social networking site (SNS) usage highlight several significant relationships that contribute to understanding the impact of digital engagement on academic performance and social interactions. Firstly, the positive influence of SNS usage on academic performance aligns with previous studies (e.g., Mosharrafa et al., 2024; Riaz et al., 2023; Sakhieva et al., 2024), that have indicated that social media can serve as a valuable educational tool. For instance, research has shown that students who effectively use SNS for academic collaboration can enhance their learning outcomes through increased access to resources and peer support (Ejoh & Lawan, 2022; Javeed, 2023). These platforms facilitate the sharing of information, the exchange of ideas, and collaborative learning, thereby fostering an environment conducive to academic success (Alshanqiti et al., 2023; Koranteng et al., 2019).

Moreover, the study's finding that SNS usage significantly influences students' social engagements is corroborated by extensive literature that emphasizes the role of social media in enhancing social connectedness among students. Studies suggest that SNSs help students maintain friendships and build networks that are vital for emotional and social support, which can be especially important during the transition to university life (Moreno-Munoz et al., 2016; Shafiq & Parveen, 2023). This social engagement is not merely a byproduct of SNS usage; rather, it plays a critical role in students' overall well-being, which can, in turn, positively affect their academic performance.

Importantly, the research indicates that social engagement mediates the relationship between SNS usage and academic performance. This finding adds depth to the understanding of how digital interactions can affect educational outcomes. Previous research has suggested that social engagement can enhance motivation and engagement in academic activities, leading to improved performance (Koranteng et al., 2019; Sigerson & Cheng, 2018). Thus, students who are more socially engaged via SNS may be more inclined to participate actively in their studies and collaborate with peers, thereby reaping the benefits of a supportive social network that enhances their academic efforts.

Finally, the moderation effect of self-regulation on the relationship between SNS usage and academic performance is particularly noteworthy. This suggests that students who exhibit higher levels of self-regulation can better leverage their time on SNS for academic benefit, rather than succumbing to distractions that could detract from their studies. Previous studies have indicated that self-regulation is a critical factor in academic success, as it allows students to manage their time effectively and prioritize academic commitments over potential distractions (Rodríguez et al., 2022; Zee & De Bree, 2017). The finding that self-regulation strengthens the positive influence of SNS usage suggests that educators may benefit from incorporating strategies that promote self-regulatory skills in conjunction with the use of social media for academic purposes.

5.1 Implications of the study

The study of the relationships between social networking site (SNS) usage, social engagement, and academic performance among Chinese university students reveals significant findings that have both theoretical and practical implications. Understanding these implications can help educators, policymakers, and researchers harness the benefits of social media while mitigating potential challenges. The insights gleaned from this research can lead to more informed practices in educational environments and offer avenues for further theoretical exploration.

The study contributes to the existing body of literature on digital engagement, social learning, and academic performance by providing a nuanced understanding of how SNS usage impacts these areas. One of the primary theoretical implications is the reinforcement of the Social Capital Theory, which posits that social networks are valuable resources for individuals (Kasim et al., 2022). According to this theory, individuals who are well-connected in social networks have better access to information and resources, which can enhance their academic success. The positive influence of SNS on academic performance suggests that these digital platforms can act as a conduit for social capital, providing students with opportunities to engage with peers, share knowledge, and collaborate on academic tasks.

Moreover, the finding that social engagement mediates the relationship between SNS usage and academic performance extends the understanding of how social interaction influences learning outcomes. This mediation implies that it is not merely the act of using SNS that leads to improved academic performance, but rather the quality and extent of social interactions that occur within these platforms. Theoretical frameworks that explore student

engagement, such as the Engagement Theory, can benefit from this insight by incorporating social engagement as a critical component in understanding student success. Future research could delve deeper into the types of social interactions that are most beneficial for academic performance, thereby refining existing models of engagement.

Additionally, the moderation effect of self-regulation on the relationship between SNS usage and academic performance introduces another layer of complexity to the existing theories on self-regulation and academic achievement. Self-regulation is a well-established construct in educational psychology that refers to the ability of individuals to manage their emotions, thoughts, and behaviors in pursuit of long-term goals (Zimmerman, 2000). The study's findings suggest that self-regulation enhances the positive effects of SNS on academic performance, implying that self-regulated learners can navigate the distractions of social media more effectively and utilize these platforms to support their academic goals. This insight could lead to the development of integrated theoretical models that account for both social engagement and self-regulation as critical components influencing academic outcomes.

The practical implications of this study are equally significant, particularly in the context of educational institutions and policy development. Educators and administrators can leverage the findings to create supportive learning environments that maximize the benefits of SNS usage while minimizing potential distractions. One immediate recommendation is to promote the integration of SNS into the academic curriculum. Educators can design assignments that encourage students to collaborate through social media platforms, facilitating peer-to-peer learning and information sharing. This approach not only capitalizes on students' existing engagement with SNS but also provides structured opportunities for social interaction that can enhance academic performance.

Furthermore, the study underscores the importance of teaching self-regulation skills to students. Given that self-regulation moderates the relationship between SNS usage and academic performance, educational programs should focus on developing students' abilities to manage their time and attention effectively. Workshops or courses on time management, goal setting, and self-monitoring can equip students with the tools they need to navigate the potential distractions of social media. Educators can also encourage the use of productivity tools and apps that help students allocate their time effectively between social engagement and academic responsibilities.

Another practical implication involves fostering a culture of responsible SNS usage among students. Institutions can implement initiatives that educate students about the benefits and pitfalls of social media. This could include seminars, campaigns, or peer-led discussions that focus on promoting a balanced approach to social media engagement. By raising awareness of the potential for both positive and negative impacts of SNS usage, students can develop a more nuanced understanding of how to use these platforms in ways that enhance their academic and social lives.

In addition to fostering individual self-regulation and responsible usage, institutions should consider creating supportive online environments that facilitate academic and social interactions. This could involve the development of dedicated academic groups or forums within existing social media platforms or even the creation of university-specific SNS platforms. Such spaces can encourage meaningful academic discussions, collaborative projects, and social engagement among students, thus enhancing both their academic experience and social connections.

5.2 Limitations and Suggestions for Future Studies

While the study offers valuable insights into the relationships between social networking site (SNS) usage, social engagement, and academic performance among Chinese university students, several limitations must be acknowledged. Addressing these limitations can enhance the robustness of future research and contribute to a more comprehensive understanding of the subject matter.

The study employed a convenience sampling method, which may limit the generalizability of the findings. While the sample size of 438 participants is commendable, convenience sampling often leads to biases, as it may not accurately represent the broader population of university students. Students who are more engaged with social media may have been more likely to participate, potentially skewing the results. Future research should consider using random sampling methods to enhance the generalizability of the findings. Including participants from various universities, regions, and socioeconomic backgrounds can provide a more representative sample of the student population and yield insights applicable across different contexts.

More so, the research utilized a cross-sectional design, which captures data at a single point in time. This design limits the ability to draw causal inferences about the relationships identified. For instance, while it may be observed that SNS usage positively influences academic performance, the directionality of this relationship cannot be established. It is possible that students with better academic performance are more inclined to engage in SNS activities, leading to a reverse causation effect. To address the limitations of cross-sectional designs, longitudinal studies should be conducted to track changes in SNS usage, social engagement, and academic performance over time. This approach would help establish causal relationships and provide a clearer understanding of how these factors influence each other over the course of a student's academic journey.

The study relied on self-reported measures, which can be subject to biases such as social desirability bias or inaccurate self-assessment. Students may overestimate their SNS usage or its positive impacts on their academic performance and social engagement. This reliance on subjective measures may affect the reliability of the findings. mploying mixed-methods designs that include qualitative components, such as interviews or focus groups, can enrich the understanding of students' experiences with SNS. This qualitative data can complement quantitative findings and provide deeper insights into how students perceive the impact of social media on their academic and social lives.

Also, the study did not account for external variables that could impact academic performance and social engagement, such as socioeconomic status, mental health, and academic discipline. These factors could significantly influence how students use SNS and their subsequent academic outcomes, yet they were not controlled for in the analysis. Future research should include external variables that may influence academic performance and social engagement, such as mental health, socioeconomic status, and academic discipline. Understanding how these factors interact with SNS usage can provide a more comprehensive picture of student outcomes.

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